20^{TH} AND 21^{ST} CENTURY HISPANIC SETTLEMENT SITES: THREE ESSAYS ON PLACE, SCHOOLING, AND STUDENT OUTCOMES

by
Dhathri Chunduru

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Abstract

The explosive growth of the U.S. Hispanic population since 1990 to newer and more non-traditional areas is the result of political, economic, and environmental instability across the world as well as a declining quality of life in large urban U.S. cities. Understanding the effects of this population growth and dispersion to less traditional areas across the U.S. on schools and students is critical for the future of educational institutions.

Using six large-scale datasets comprising population-level and survey data, the three papers of this project attempt to advance our understanding of how Hispanic settlement sites in the late 20th and early 21st centuries are distinct from one another and the ways in which these distinctions shape the schooling experiences of Hispanic students. Beginning with an exploration of place, the first paper lays the foundation for how Hispanic sites of settlement could be categorized to account for the various causes of migration and dispersion in the 1990s versus the 2000s. The second paper explores how sites of settlement may shape the achievement of Hispanic students. Finally, the third paper probes the effects of a specific school-level mechanism – within-school stratification – on student outcomes. It also considers the extent to which this effect varies by place to emphasize how institutions might reinforce racial and social hierarchies based on the social and legal contexts, co-ethnic status, and racial and ethnic diversity of an area.

The findings of this project indicate that there are distinctions in both the population compositions and institutional characteristics of 21st and 20th century sites, which offers support for the need to distinguish between these areas. Furthermore, there are diverging stories of achievement and post-secondary educational attainment, such that student achievement in newer sites is higher than in established sites, while post-secondary attainment and success of students is far lower. Finally, I find that within-school stratification as a racialized system broadly reflects the stratification of place and is negatively associated with college enrollment. The contributors to post-secondary attainment, particularly for Hispanic students, many of whom might be immigrants, is a far more complex process that may extend beyond the functions of secondary schooling.

Primary Reader and Advisor: Stephen L. Morgan

Acknowledgements

I am grateful to my advisor, Professor Stephen L. Morgan, for introducing me to the world of the sociology of education and causality. His guidance during my PhD study, particularly in instilling the importance of nuance and restraint in one's conclusions, has been invaluable. While "correlation is not causation" is the saying du jour in most social sciences, the likelihood of practicing such discipline continues to be rare. Steve's groundbreaking work in causality has developed in his students a respect for the nature of the counterfactual, a perspective that I will carry with me in all of my professional and academic work. I am also thankful for his forthrightness and direction, which helped me hone my study, my research practices, and provoked many of my current and future research interests.

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Finally, I would like to thank my parents, Nageswara Rao and Lalitha Chunduru, whose endless sacrifices and support throughout my life have rendered it possible to pursue and complete this PhD. I could not have done it without them.

Dedication

This dissertation is dedicated to my husband, David, a man whose patience, support, and generosity know no bounds.

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Chapter 1

Foreword

Foreword

As political, economic, and environmental instability across the world continue to grow, international migration to the U.S. has become increasingly attractive to many. In addition, declining quality of life in large urban U.S. cities has spurred domestic migration to newer and more suburban areas. The explosive growth of the U.S. Hispanic population since 1990 to newer and more non-traditional areas is an example of this phenomena. Understanding the effects of this population growth and dispersion to less traditional areas across the U.S. on schools and students is of critical interest to policymakers, researchers, and community leaders alike. In this project, I focus on the relationship between place, schools, and student outcomes, specifically for Hispanic students.

For the three papers that comprise this project, I use six large-scale datasets. Population-level data are acquired from the 1990 and 2000 U.S. Decennial Census and the American Community Survey's 5-year estimates from 2009 to 2013. School-level data are extracted from the 2013 Common Core of Data. Finally, I use cross-sectional math achievement data from the 2013 8th and 12th grade National Assessment of Progress (NAEP) and longitudinal post-secondary outcome data from the High School Longitudinal Study (HSLS). The HSLS has released four rounds of survey data from students, administrators, and parents for 9th graders beginning in 2009, with the latest release in 2016. I combine the population and school level data with student level data using school and school-district identifiers from the National Center of Education Statistics (NCES) as well as county FIPS codes.

Foreword

In the first paper, I use the 1990 and 2000 Census and the 2009-2013 ACS to establish an empirical classification of Hispanic sites of settlement that distinguishes between Hispanic migration and dispersion to non-traditional areas in the late 20th century and early 21st century. Five areas are created in alignment with prior demographic scholarship led by Daniel Lichter and colleagues (2010). These areas are established sites, which are comprised of large concentrations of Hispanics since 1990; 20th and 21st century sites, areas that had small populations of Hispanics prior to 1990 and 2000, respectively, but then experienced rapid growth in the following decade; and two types of "non-sites," which are areas that have not necessarily had significant concentrations of Hispanics nor have experienced significant growth in the existing population over time. Comparisons in this project are conducted between the three types of *sites,* and *non-sites* are used as references. Like prior work, I use county designations to develop these sites given the lack of school-district aligned information prior to 2000. In contrast to prior work, these areas are developed using relative compositional change rather than absolute growth; school-aged population of Hispanics, which are defined as individuals under the age of 19; and account for differences in the causes of migration and dispersion in the 1990s vs. 2000s. Given that the key mechanisms of interest for this project are place- and school-based, I also explore how the population compositions of school districts, and school characteristics of the sites vary in this first paper using ACS and CCD data. The results suggest significant differences between 20th and 21st century sites, justifying the need to distinguish between the two.

In the second paper, I explore the effects of place on 8th and 12th grade math achievement using the NAEP. I theorize that the site-level mechanisms most associated with achievement are social and residential segregation of Hispanics, and co-ethnic status, as determined by the education levels of Hispanics in the school district. While the former shapes concrete opportunities available, the latter shapes the adults' perceptions of Hispanic students which may influence the opportunities made available to them. School-level mechanisms of greatest interest to this paper are school resources, which include per-pupil expenditures, teacher tenure, and teacher absenteeism; and school composition, which is measured by the percentage of Hispanic students in a school. Individual mechanisms of interest include those related to sociocultural explanations of achievement or familism, measured by parental engagement with their children's education; and socioeconomic status. I use a series of logistic regressions to find that place does, indeed, affect the achievement of Hispanic students.

In the third paper, I interrogate school-level mechanisms more closely. Using data from the HSLS, I explore whether within-school stratification affects Hispanic students' long-term outcomes and the extent to which this variation differs by site. Racialized organizational theory and place stratification theory serve as the foundation of the theoretical framework for this paper. The former, as developed by Ray (2019), theorizes that organizations are racial structures with the power to either reproduce or challenge the broader social processes of racialization. The latter argues that the sorting of racial and ethnic minorities in an area occurs according to the group's relative standing in society. I bridge these ideas together by arguing that within-school stratification occurs as a response to Hispanics' relative standing in the areas. For example, if Hispanics hold higher co-ethnic status in a certain area, I would expect to see lower levels of within-school stratification. I develop a conceptual model aligned to this theoretical framework and use a series of logistic regressions to test each level of mechanism on one outcome, college-going. Then, I test the complete model on the three other outcomes of interest: high school graduation, level of college, and persistence in college. Ultimately, the results suggest that while significant variation in these long-term outcomes exists between sites, within-school stratification does not meaningfully affect their predicted probability, except in established sites. The limitations of a small sample size and even smaller cell sizes in certain areas across outcomes likely contribute to these findings.

These papers should be considered in relation to one another. Beginning with an exploration of place, the first paper lays the foundation for how Hispanic sites of settlement could be categorized to account for the various causes of migration and dispersion in the 1990s vs. the 2000s. The second paper explores how sites of settlement may shape the achievement of Hispanic students. Finally, the third paper probes a specific school-level mechanism – within-school stratification – and its relationship to place and student outcomes to consider how institutions might reinforce racial and social hierarchies based on place and the social standing of Hispanics in the area.

CHAPTER 2

An Empirical Categorization Distinguishing between Era-Specific Migration Patterns

An Empirical Categorization Distinguishing between Era-Specific Migration Patterns

Abstract

This paper examines the school and school district characteristics of Hispanic settlement areas in the 20th and 21st centuries. Using decennial Census data from 1990 and 2000, and American Community Survey 5-year estimates from 2009-2013, I find that 21st century sites are home to more advantaged and native-born Hispanic populations. Furthermore, schools in 21st century sites have lower concentrations of Hispanic students, spend more on students, and are slightly more integrated than schools in 20th century sites. These findings indicate that the 20th and 21st century sites are worth distinguishing from one another. This paper contributes to the nexus of “new destination” and education literature by offering an empirical categorization that uses the relative compositional change of the school-aged Hispanic population across counties as well as population-level data from 1990 to 2013.

Introduction

As political, economic, and environmental instability across the world continue to grow, immigrating to suburban and rural areas across the U.S. has become increasingly attractive to many Hispanics. In addition, declining quality of life in large urban U.S. cities has spurred domestic migration to these areas as well. The explosive growth of the U.S. Hispanic population since 1990 to newer and more non-traditional areas is one result of these phenomena. Understanding how this population growth and dispersion of Hispanics as well as their dispersion to newer and more non-traditional areas across the U.S. affects the contexts of these areas as well as the institutions responsible for their incorporation is of critical interest to policymakers, researchers, and community leaders alike.

In this study, I establish an empirical classification of Hispanic sites of settlement that distinguishes between Hispanic migration and dispersion to non-traditional areas in late 20th century and early 21st century. Furthermore, because public schools are one of the most critical public institutions that engage with and receive newcomers across the country, I focus on how they vary between sites. I find that variation in the population, school district, and school characteristics of these sites compels us to develop a more nuanced picture of both migration patterns by decade and measures specific to the analysis of interest.

Two primary factors motivate this study. First, while we know what policies and processes shaped immigration and domestic migration to new Hispanic areas throughout the 1990s, comparatively little is known about the causes of 21st century growth and movement to new areas. The conflation between movement that occurred during the 1990s and 2000 onwards has contributed to ambiguity regarding both the composition of Hispanics in new sites of settlement, as well as the areas, themselves. Second, the measures used to determine which places are constituted as new areas of Hispanic settlement greatly vary. Most studies use some variation of sub-state level units and focus on 1990 to 2000 growth. In this project, I advocate for the use of measures that are aligned to the analysis of interest. Because this project is concerned with how public schools in new Hispanic areas measure up with schools in more traditional areas, I use school district geographic boundaries as the primary unit of analysis for determining new Hispanic sites of settlement.

The forerunners of scholarship regarding post-1990 Hispanic dispersion include Daniel Lichter and colleagues, who described these new areas, previously home to few Hispanics, as “new destinations” (See, for example, Lichter & Johnson, 2009; Lichter, Parisi, Taquino, & Grice, 2010). These places are characterized as areas with small concentrations of Hispanic Americans prior to 1990 which then experienced rapid growth. In contrast, “established destinations” are defined as large urban areas, in which large numbers of Hispanics settled throughout the latter half of the 20th century.

Building on the work of Lichter and colleagues, I establish three types of sites which differentiate areas by era of settlement: those that settled between 1990 and 2000, 2000 and onwards, and areas home to large groups of Hispanic populations prior to 1990. These are 20th century sites, 21st century sites, and established sites, respectively. Furthermore, I develop two types of “non-sites” to differentiate areas that have a small and consistent population of Hispanic students, but do not necessarily contain the concentration to influence schools. Figure 1 offers a glimpse into the placement of these sites, which are defined by county boundaries, throughout the United States. Using this classification, this study emphasizes the need for a nuanced perspective regarding Hispanic movement that takes into consideration different causes of movement and a categorization scheme that is aligned to the analysis of interest.

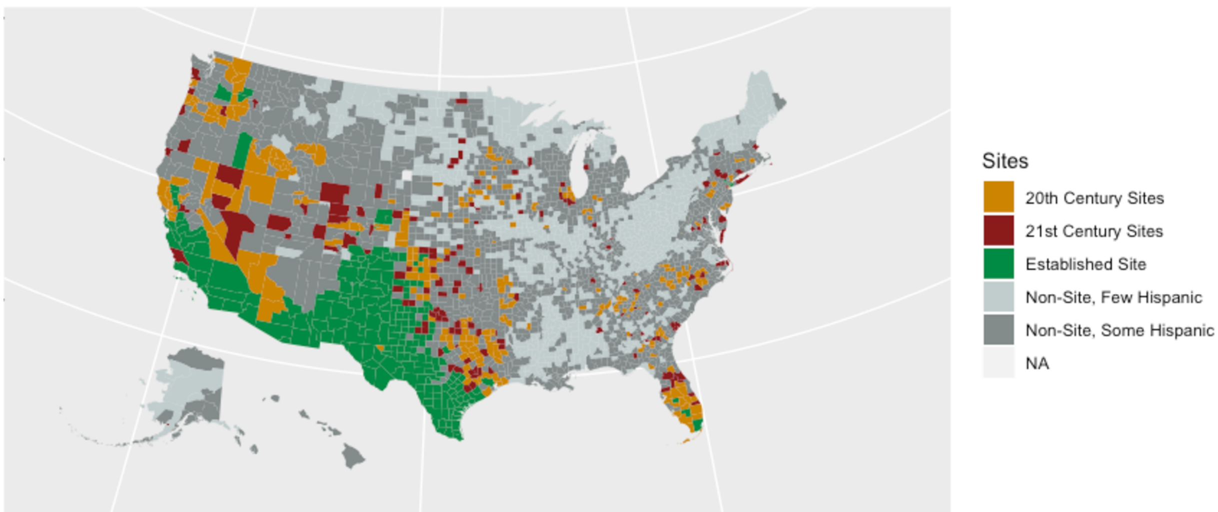

FIGURE 1. This project's categorization of sites of Hispanic settlement uses Census data between both 1990-2000 and 2000-2013. There were no areas that were both 20th and 21st Century Sites. This classification uses school-aged Hispanic population, e.g. of 0-19 years, instead of the general Hispanic population as well as percent growth rather than absolute growth in population.

Background

Drivers of Hispanic Settlement in the 20th and 21st Centuries

Multiple co-occurring processes contributed to Hispanic settlement in new areas, many with early roots. Beginning in the early 1900s, policies aimed at meeting the need for external labor encouraged Hispanic migration from Mexico and Latin American countries to the United States, yielding intended and unintended consequences. In a comprehensive history of the era, Durand, Massey, and Chavet (2000) noted that the early 1900s were marked by sporadic Mexican settlement in Texas and later California in the 1920s and 1930s. Later, the Bracero program of 1942-1964, which was the result of bilateral agreements between Mexico and the United States, was responsible for millions of short-term Mexican agricultural workers in the United States, most of whom resided in California. Although the program ended in 1964, the demand for labor from Mexico did not. In fact, it increased throughout the 1970s due to the rise of globalization and an economic decline in Mexico (See, for example, Canales, 2010; Durand et al., 2000; Fourcade-Gourinchas & Babb, 2002; Riosmena & Massey, 2012; as cited in Crowley & Knepper, 2019). This caused a rapid expansion of Mexican immigration, primarily through what were now *illegal* channels.

In 1986, the United States passed the Immigration Reform and Control Act (IRCA), which Massey and colleagues attribute for the explosive growth in both Mexican and Central American immigrants to the United States beginning in the 1990s (See Durand et al., 2000; Massey, Durand, & Malone, 2002). IRCA was characterized by a two-pronged approach that offered legal status to approximately three million unauthorized immigrants in the nation while simultaneously tightening border restrictions. These restrictions coupled with stricter enforcement along the border contributed to an increased risk associated with frequent movement across the U.S. – Mexico border. As a result, permanent migration to the United States increased drastically. Furthermore, per Parrado and Kandel (2008a), these stricter border enforcements contributed to movement beyond the regularly travelled portions near San

Diego and El Paso towards areas that were much less traversed, thus launching the dispersion of Hispanic immigrants into newer areas.

In addition to IRCA, Ellis, Wright, and Townley (2014) attributed economic growth in the southern, western, and midwestern United States in the 1990s and simultaneous slowdowns in traditional coastal immigrant cities to making areas outside of traditional sites increasingly attractive to immigrant communities. Economic growth in these new areas was largely a result of booms in industries such as poultry (Kandel & Parrado, 2005), food processing (Fennelly & Leitner, 2002), and carpet-making (Hernandez-Leon & Zuniga, 2000).

Furthermore, domestic movement from established to newer areas also contributed to net migration to newer areas. Corporations actively recruited workers from urban areas to fuel the high turnover rates in these industries (See, for example, Hernandez-Leon & Zuniga, 2000; Kandel & Parrado, 2005; Parrado & Kandel, 2008b). In addition, a desire for greater economic and social opportunity encouraged families to relocate to newer areas.

Much of what we know about drivers of Hispanic migration and settlement in newer areas is related to the late 20th century. The causes of movement in the 21st century are not as well understood. Scholars speculated that continued social processes such as fertility (See, for example, Lichter & Johnson, 2009) and a desire for a better quth5 6ality of life (See, for example, Fennelly and colleagues, 2005; 2002) would continue natural Hispanic population growth in newer areas. However, reliable evidence to suggest that these speculations are the case is sparse.

Characteristics of Populations in New Areas

The regional concentration of Hispanic immigrants that once persisted in border states began to rise throughout the United States after 1990. The economic, social, and political processes that caused this dispersion in the 1990s also shaped the characteristics of Hispanic newcomers, themselves. Parrado and Kandel (2008b), for example, found that the low-wage, low-skill employment opportunities that contributed to the rise of new sites also attracted immigrants who were more likely to be from lower socioeconomic backgrounds and first-generation immigrants in new areas in comparison to established areas, findings supported by Lichter and colleagues (See also Johnson & Lichter, 2016; Lichter, Sanders, & Johnson, 2015).

In addition to being more likely to be from low-income backgrounds, Hispanics in newer areas were more likely to lack legal authorization to reside in the United States compared to their counterparts in established areas (Massey, 2008, & Zuniga and Hernandez-Leon, 2005). In a case study of two school districts in Georgia, a state that has experienced some of the largest Hispanic growth in the country since 1990, Hamann (2001) estimated that almost three-quarters of the Hispanic population are unauthorized. The plausibility of this estimate is supported by policy reports (See, for example, *New destinations: Mexican immigration in the United States*, 2005).

Because most scholarship in the field is focused on the contributors to Hispanic settlement between1990 and 2000 rather than after 2000, we know little about the population characteristics of sites that were newly settled in the 21st century. Yet some case studies of “pre-emerging gateways,” which Singer, Hardwick, and Brettell (2008) define as areas in the early 2000s that are on the verge of experiencing Hispanic booms similar to that of the 1990s, help predict how the population characteristics of areas settled by Hispanics in the 21st century might be distinct from areas settled in the late 20th century. First, in a case study of Charlotte, North Carolina, Smith and Furuseth (2008) discuss the “powerful myth” that Hispanic newcomers are more likely to settle in “single, homogenous, disadvantaged and overwhelmingly Latino barrio, with stereotypical crime, illegality, and poverty” (p. 284). Upending classic patterns of assimilation in which immigrants are more likely to settle first in ethnic enclaves, the authors found that these newer sites are actually more likely to be sites of heterolocality, e.g. dispersed residential patterns of new arrivals, a term coined by Zelinsky and Lee (1998). In addition to more dispersed residential settlement patterns, 21st century sites may also be home to more variation in the socioeconomic, racial, and foreign-born composition of newcomers. In a case study of the suburban rings of Austin, Texas, Skop and Buentellp (2008) found a bifurcated pattern of immigration to new sites led by booms in both technology and manufacturing industries.

Characteristics of Schools in New Sites

It is critical to understand how public schools are adapting to influxes of new students, who are reshaping schools’ demographic compositions in significant ways. Of the school characteristics of greatest interest for this study are race-ethnic composition and school resources. Complicated by the varied measurement techniques associated with defining new sites of settlement, the few studies in the field focused on school segregation yield uneven and conflicting results. In regards to school segregation

Lichter et al. (2010) found that Hispanic students in new areas, largely non-metropolitan, are less likely to be segregated by schools than in established areas, due to smaller concentrations. However, Reardon, Yun, and Eitle (2000), in their comparison of metropolitan cities to one another, found that rising residential segregation contributed to rising segregation between White and minority students. Similarly, Fry (2011) found that the suburbanization and dispersion of Hispanic students did not contribute to greater integration. In 30 new settlement areas, the study found that 54 percent of Hispanic students attend majority-minority schools, in comparison to only 11 percent of their white peers.

Scholarship regarding school-based resources in new sites also varies in its conclusions. For example, Dondero and Muller (2012) found fewer support services for English language learners in new areas compared to established areas, while Potochnick (2014) found that schools in newer areas adapt to students in ways that support learning. Although these authors use the same data, their findings contradict one another, as a result of variation in construct development and methodology.

In addition, case studies based on specific areas that have experienced demographic change have found that although schools in suburban or newer areas may adopt certain behaviors and policies to meet the needs of a changing demographic more quickly than in established areas, they often revert to the status quo. For example, in a survey analysis of Wisconsin schools, Lowenhaupt (2016) found that suburban schools were more likely to offer opportunities for integrating schools such that second-language English speakers had greater access to core academic classes and native

English speakers, compared to their peers in urban areas. However, the author concludes that these policies likely did not persist beyond their initial implementation period (Frankenberg as cited in Lowenhaupt, 2016). In another study of Dalton, Georgia, Edmund Hamman and colleagues found that many initiatives aimed at welcoming new students, particularly ones who did not yet speak English via a comprehensive set of school- and community-based programs, ultimately failed (Hamann, 2002; Hamann, Wortham, & Murillo Jr., 2002).

Analytic Strategy

The two motivations for this study, which inform the analytic strategy for this study are as follow. First, many studies chronicled this rise of Hispanic populations in small towns across the Midwest and Southeast, which began to surge between 1990 and 2000 (See, for example, Jensen, 2006; Kandel & Cromartie, 2004; Lichter & Johnson, 2009; Lichter, Johnson, Turner, & Churilla, 2012). But, few have chronicled diasporic dispersion after 2000 as a separate phenomenon. Thus, a distinction between where Hispanics have settled in the 21st century vs. the late 20th century is required.

Second, the measures used to determine sites of settlement greatly vary within the literature. Some studies, particularly policy related ones used states as the primary units to determine new sites (See, for example, Clotfelter, Ladd, & Vigdor, 2012; Massey, 2008; Potochnick, 2014). Within sub-state level units, four primary methods of determining new sites of settlement take precedence. Kandel and Cromartie (2004), for example, focus primarily on non-metropolitan areas and use both baseline and growth of Hispanic or Latino populations to classify growth. In contrast, others focused on metropolitan and non-metropolitan areas, but used different population groups to define growth.

The typologies developed by Fischer (2010) and adapted by others such as Dondero and Muller (2012) focused on the growth of foreign-born populations, rather than specific race or ethnic groups. Conversely, Lichter et al. (2010) used Hispanic population growth in all areas, but limited focus to non-metropolitan areas, in which Hispanics only comprise 1.2% of the overall population. Finally, Hall (2013) used composition and growth in immigrant groups by country of origin in the 100 largest metropolitan areas to determine categories of areas. This method is adapted by others as well (See, for example, Ackert, Crosnoe, & Leventhal, 2019; Frank & Akresh, 2016).

While these methods for determining new Hispanic sites are critical for demographers, institution-specific scholars would benefit from measures aligned to their institutions of interest. In this study, I offer an approach in which I categorize new sites using measures specific to public schools, given the focus on how public schools adapt to demographic change. Finally, given that public schools are often the first and most comprehensive public institution that demographic change affects, this study focuses on the variation in public school and school district characteristics between Hispanic settlement sites. The research questions for this study, then are as follow: (1) How do the Hispanic sites of settlement in the late 20th century differ from those of the early 21st century? (2) What population characteristics distinguish these new sites? (3) How do public schools vary between sites?

Classifying 21st and 20th Century Hispanic Sites

Data. I use decennial data from 1990 and 2000 and five-year estimates from the 2009-2013 American Community Survey (ACS). The decennial Census is a national survey that is administered to all households, while the ACS is administered to 3.5 million households each year by the United States Census Bureau. Both collect information across a broad range of topics including, demographic, financial, and social information.

The 5-year ACS estimates from 2009-2013 are geocoded to school district boundaries, which were curated by the Missouri Census Data Center.[1]Because school district geographic boundaries change regularly,[2] I do not geocode the 1990 or 2000 Census data to school district boundaries.[3] Thus, to obtain the most comprehensive picture of the nation, I align school districts with their corresponding counties, which are far more consistent between 1990 and 2013. I combine ACS data with corresponding decennial Census data from 1990 using county identifiers to develop baseline estimates of the Hispanic school-aged population (0-19 years old) to develop the categorization of 21st century new destinations.

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[1] Beginning in 2009, the Education Demographic and Geographic Estimates (EDGE) division of the U.S. Census Bureau began offering ACS estimates bounded by the geographic boundaries of school districts. However, the most comprehensive and recent adaptation of ACS estimates to school district boundaries was curated from the Missouri Census Data Center for 2009-2013. Thus, I use this set of data over the EDGE estimates from later years as it contains a wealth of ACS estimates.

[2] For example, in 1990, there were 15,358 regular school districts, in comparison to 13,567 and 13,598 regular school districts in 2011 and 2017, respectively. These years are the most recently available sources of data from the NCES. Conducting an analysis using school districts between 1990 and 2013 would require geographic recoding of more than 3,000 school districts, which is beyond the scope of this analysis ("Number of public school districts and public and private elementary and secondary schools: Selected years, 1869-70 through 2010-11," 2012).

[3] Future analysis might consider how changing school district boundaries has been a potential response to changing demography. However, the limitations of this study prevent such an analysis.

This data contains 3,132 of the 3,143 counties in the United States. There are 11 areas which are not included in the 2009-2013 ACS 5-year estimates because are largely unincorporated or rural areas with small populations.[4] Within these 3,132 county areas, there were 17,264 school districts, which includes regular school districts, local education agencies, state-operated agencies, federally operated agencies, and charter school districts, as of 2013.

Finally, to determine changes in metropolitan status, I source county classification data from the National Center for Health Statistics, which uses a widely accepted scheme for urban-rural classification of counties.[5]

Method. Sites, in this project, are developed in the tradition of Lichter et al. (2010),[6] but contain important variations. First, three types of sites are defined. These are established sites (ES), 20th century sites (20th CS), and 21st century sites (21st CS). Like the typologies constructed by Lichter and colleagues (2009; 2010), areas which

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[4] Six of these eleven areas are Census areas in Alaska, which are largely uncovered in the ACS. These areas are Bedford City, VA; Broomfield County, CO; Hoonah-Angoon Census Area, AK; Issaquena County, MS; Kalawao County, HI; Loving County, TX; Petersburg Census Area, AK; Prince of Wales-Hyder Census Area, AK; Skagway Municipality, AK; Wade Hampton Census Area, AK; Wrangell City and Borough, AK.

[5] The NCHSUR uses six primary codes to classify areas. In comparison the U.S. Census only identifies three types of areas: Urbanized areas, which are areas with 50,000 people or more and urban clusters which are areas with between 2,500 and 50,000 people. Rural areas, in comparison, are simply areas that are not included within urban areas.

[6] Per Lichter et al. (2010), new destinations are essentially areas which had small Hispanic populations in 1990 and experienced rapid growth over the following decade. These areas include central cities, metro suburban places, and nonmetro places. Counties in which the Hispanic population was less than the national percentage (9%) in 1990 and experienced a growth of at least 200 Hispanics between 1990 and 2000 were labeled as new Hispanic destinations, which yielded 257 counties. Of these, 26 were metro central cities, 160 were metro suburban places, and 71 were non-metro places. Ultimately, Hispanics in new destinations accounted for only 1.2% of the total U.S. Hispanic population in 2000. Although more simplistic categorizations persist (See, for example, Dondero & Muller, 2012; Fischer, 2010), to situate this study within the extant literature, I build on the methods developed by Lichter et al. (2010), which most other research in the field uses. Lichter et al.'s school districts matched with their corresponding counties which yields 459 of the 889 school districts as established, new, and other Hispanic destinations.

have been home to large Hispanic enclaves prior to 1990 are referred to as established sites.

Areas that did not have large concentrations of Hispanic school-aged children in 1990 but experienced rapid growth between 1990 and 2000, as measured by population growth larger than one standard deviation above the national mean, are classified as 20th century sites. Similarly, 21st century sites are classified as areas that experienced the same level of growth, but between 2000 and 2013. Of 3,132 counties, 247 counties experienced rapid growth in both the 20th and 21st centuries. These 247 sites were designated as 20th century sites and *not* 21st century sites because they were first sites of settlement in the earlier era and persisted in their growth over the next era. Sites that experienced rapid growth in *both* eras are categorized only as 20th century sites given that were first sites of settlement in the 20th century and maintained their growth throughout the 21st century.[7]

Of sites that did not experience rapid growth, I categorize those that have a population in the top 25th percentile of 0-19 aged Hispanics in 2013 as "non-site, some Hispanic," which is roughly equal to 3.5% of the population. All other areas fall under the category of "non-site, few Hispanic." This distinction is made to differentiate areas that have a small and consistent population of Hispanic students, but do not necessarily possess the concentration to influence schools from areas with negligible populations of Hispanic students.

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[7] Of the 3,143 counties in the dataset, 247 counties experienced rapid growth over both the 1990-2000 and 2000-2013 period. Of these 247 counties, 197 of them overlapped with 20th century sites and 50 of them overlapped with established sites (expectedly, none overlapped with 21st century sites).

Assessing Variation in Population Level Characteristics

Data. I use school-district aligned data from the 2009-2013 ACS five-year estimates described earlier instead of decennial Census information from 2010 to assess variation in population level characteristics to ensure that this analysis is aligned to the institution of interest for this study. School districts (N = 17,264) are the key geographic area of interest to compare site characteristics to one another, because of the integral role they play in shaping how public schools respond to students. I rely on a seminal framework developed by Bidwell and Kasarda (1975) (See Figure 1 in Appendix) which characterizes school districts as powerful enough to transform environmental inputs via social organization in a few key domains.[8]

Measures. I focus on variation in several measures including the racial and ethnic composition of the area, the educational levels of specific race-ethnic groups, foreign-born status, as well as overall measures of economic well-being. Although the use of ACS estimates allows for school-district aligned data, some limitations exist. These include the prevalence of specific data. For example, this geocoded data does not disaggregate employment, foreign-born, or economic well-being information by race-ethnic groups. As a result, I rely on total population-level analysis for this component of the descriptive analysis.

[8]The framework offers a model to conceptualize the decision-making power of school districts. These decisions include the allocation of the budget, of resources between instructional and non-academic service, the supervision of specialists such as counselors and therapists, and the certification and quality of personnel. The framework, however, is not enough to explain the sources of variation in achievement. Most notably, the framework argues that school districts explain the majority of variation in student achievement, without addressing individual and family characteristics, an oversight pointed out by (Alexander and Griffin (1976). However, it is sufficient for modeling the decision-making interaction between districts and schools.

Assessing Variation in School Characteristics

Data. To assess variation in school characteristics, I use data from the 2013 Common Core of Data (CCD), which offers comprehensive information about student, school, and school district characteristics. The CCD is the Department of Education's primary database of *all* public schools and school districts in the nation. This dataset contains data for all 101,070 public schools in the nation.[9] The analytic sample (N = 91,009) is created by maintaining schools within the 0 to 99th percentile of expenditures to ensure a smooth distribution. For a more explicit description of this decision, see Appendix**.**

Measures. I develop a cost-adjusted measure of *per-pupil spending* based on both consumer indices and urbanity of the school, using a technique provided by the Bureau of Labor Statistics. Although an imperfect measure of school-level socioeconomic status, the *total free and reduced lunch* percentage measure serves as a proxy for school-level socioeconomic status.

I also measure the level of *student segregation* using both interaction and isolation indices. Interaction indices measures the exposure of minority group members to members of the majority group within public schools by site. This is done by developing a minority-weighted average of the majority proportion of the population in each areal unit, which in this case is the school district. The equation for this interaction index is as follows,

[9] The information collected includes school-level demographics including race, ethnicity, English language learner status, and students with IEPs. It also includes fiscal and human capital information about each school including per-pupil expenditures and revenue as well as the allocation of personnel to each school.

$$\sum_{i=1}^{n}\left[\left(\frac{x_i}{X}\right)\left(\frac{y_i}{t_i}\right)\right], \tag{1}$$

where x_i represents the minority, e.g. Hispanic, population of school district i, and X represents the sum of all x_i, e.g. the total Hispanic population; The majority, e.g. White, population in school district i is represented by y; and t_i represents the total population of school district i. Figure 4 illustrates the comparison of interaction indices between the three sites of interest.

In contrast to the interaction index, the isolation index measures the exposure of minority groups with one another. It is represented by the following formula,

$$\sum_{i=1}^{n}\left[\left(\frac{x_i}{X}\right)\left(\frac{x_i}{t_i}\right)\right], \tag{2}$$

where x_i represents the minority population, e.g. students who are not White, of school district i and X represents the sum of all x_i, e.g. the total minority population. The remaining variables are consistent with Equation 2.

Findings

Developing a New Classification: 20th Century, 21st Century, and Established Sites

Growth in new sites. A new classification for Hispanic sites of settlement introduced in Figure 1 divides "new" sites into 20th and 21st century sites, in addition to established sites. Of the 3,132 counties, 281 are designated as 20th century sites, 150 as 21st century sites, and 219 as established sites. The remaining are categorized as non-sites, which include areas with some Hispanics and the rest with few if any Hispanics.

As Figure 2 illustrates, growth in established sites is relatively consistent between the decades increasing approximately five to seven percent between each decade compared to growth in 20th century sites, which exceeds 20 percent in two decades. While 21st century sites do not grow as much as 20th century sites, e.g. from 6.22 to 19.94 percent, the rate of growth over 2000-2013 parallels growth in 20th century sites. The distinction between 20th and 21st century sites is that 21st century sites did not experience rapid growth between 1990 and 2000, but only after 2000.[10]

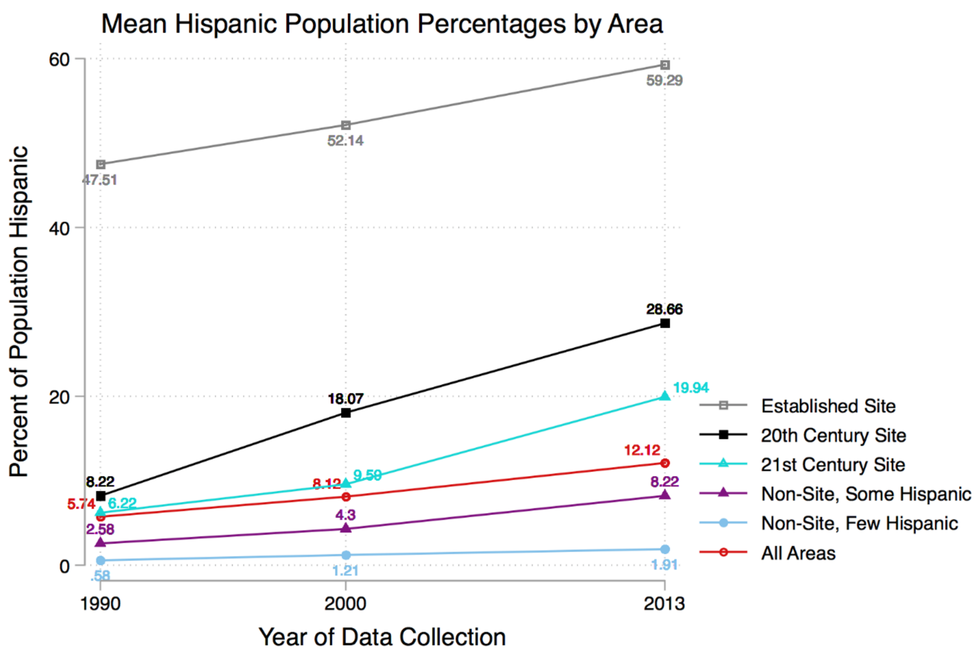


FIGURE 2. Change in Hispanic populations by area, over three time points.

Another perspective growth includes considering how the metropolitan status counties in this project have changed since 1990. In Table 1, I demonstrate change in

[10] The distinction between 20th and 21st century sites can be explained by the pace of growth between 1990 and 2000 compared to growth between 2000 and 2013. 20th century sites experienced dramatic growth in their 0-19 aged Hispanic populations from 8.22 to 18.07 percent, on average. Meanwhile, this population in 21st century sites in that decade grew from only 6.22 to 9.59 percent. However, in the later decade from 2000 to 2013, growth in 21st century rates boomed and was more than 10 percent.

metropolitan status between 1990 and 2013 varies by type of site. Overall, I conclude that 21st century sites are much more likely to be areas that have recently boomed in overall population relative to 20th century sites, given that they were more likely to shift from non-metropolitan to metropolitan status between 1990 and 2013. As Table 1 demonstrates, between 1990 and 2013, of the 150 21st century sites, 29 shifted from non-metropolitan to metropolitan while 4 shifted in the opposite direction. In comparison, only 19 of the 281 20th century sites shifted from non-metropolitan to metropolitan status. Finally, I find that established sites they are largely non-metropolitan (See Table A2 in Appendix), in contrast to prior scholarship, which characterized them as largely urban and metropolitan (See, for example, Lichter & Johnson, 2009; Lichter et al., 2012; Lichter, Lee, et al., 2015; Lichter et al., 2010; Lichter, Sanders, et al., 2015). A more detailed analysis of metropolitan classification can be found in Table A2 in the Appendix.[11]

[11] Of the 219 established sites in the country, approximately 7 percent of counties shifted from non-metropolitan to metropolitan status between the two periods, likely a result of overall population growth. The majority of counties, 66 percent, are still non-metropolitan even among established sites. 20th century sites follow a similar pattern as established sites. Of the 281 sites, 10 percent of sites shifted from nonmetropolitan to metropolitan between 1990 and 2013. The balance between metropolitan and non-metropolitan is more evenly distributed, however, with 44 percent of 20th century sites classified as metropolitan in 2013. In contrast, 21st century sites are much more likely to be non-metropolitan than 20th century sites at 65 percent. Therefore, 21st century sites mirror established sites more closely than 20th century sites, in terms of the distribution of counties between metropolitan and non-metropolitan areas as well as the shift from non-metropolitan to metropolitan over the two periods.

TABLE 1. Changes in Metropolitan Status from 1990 to 2013

	No Change	Metropolitan to Non-Metropolitan	Non-Metropolitan to Metropolitan	Total
Established Sites	204	0	15	219
20th Century Sites	251	1	19	281
21st Century Sites	134	4	29	150
Non-Site, Some Hispanic Sites	1,247	21	12	1,453
Non-Site, Few Hispanic Sites	898	9	185	1,028
Total	2,734	35	121	3,132

Note. Classification of metropolitan status determined using the National Center for Health Statistics data systems scheme for urban-rural classification for counties.

Locations of new sites. I find that states that experienced rapid growth in the 1990s also likely experienced growth in the 2000s. However, there are a number of states whose growth after the 1990s subsided in the 2000s. Referring back to Figure 1, established sites are largely located in the Southwestern United States, while 20th and 21st century sites are distributed throughout the West and Southeast. Most counties, however, fall under the categorization of “non-sites.” The distribution of sites between states illustrates some interesting patterns. States home to large numbers of all three types of sites include Colorado and Texas (See Table A3 in Appendix). In contrast, Midwestern states such as Illinois, Iowa, and Minnesota and Western states such as Idaho and Washington do not necessarily have a large number of 21st century sites but are home to several 20th century sites. Furthermore, the converse is not necessarily true. States with 20th and 21st century sites, but not necessarily established sites include Southern states such as Florida, Georgia, and North Carolina and Western states such as Nebraska, Oregon, Nevada, and Utah.

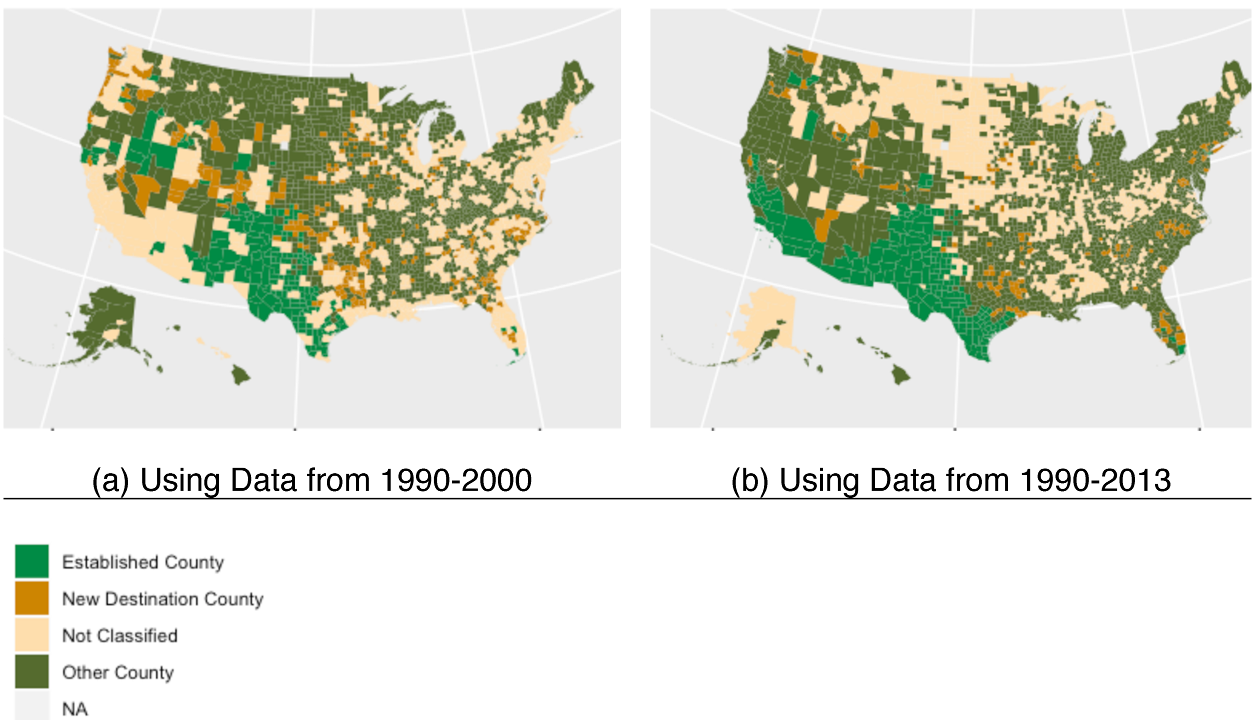
How new sites compare to new destinations. I replicate the classification scheme that Lichter et al. (2010) used to develop “new destinations” and “established destinations" in Panel A of Figure 3. Lichter et al. (2010) identified 257 counties as new destinations, of which, 26 were metro central cities, 160 were metro suburban places, and 71 were non-metro places. Put simply, Lichter et al. (2010) defined new destinations as areas with a Hispanic population less than the national average of nine percent in 1990, which then experienced a growth of at least 200 Hispanics between 1990 and 2000.

To illustrate why Lichter et al.'s (2010) categorization may need an update, I use population data from 1990 to 2013 and their categorization method. Thus, in Panel B of Figure 3, I demonstrate what Lichter et al.'s (2010) original methodology might look like if applied to more recent population data. Established destinations would make up much more of the Southwest and West and new destinations would be far less prevalent.

New destinations are far more prevalent in Panel A than in Panel B. In fact, in Panel B, the number of new destinations falls from 281 to 151. This suggests that only 53 counties maintained rapid growth over the 23-year period to meet the criterion required for new destinations, likely a result of the to achieve sustained and rapid growth over two decades, as defined by growth higher than two standard deviations of national growth. Furthermore, the impetus for movement to new areas is likely different between 1990 to 2000 than it is from 2000 to 2013. It is difficult to maintain that the new destinations established using 1990 to 2000 data are relevant to shifts in population that have occurred since.

In comparison to Panel B of Figure 3, this project's categorization of new sites in Figure 1 distinguishes between that 20th and 21st century sites, as evidenced by the fact that 150 counties experienced new and rapid growth in the 21st century.

Furthermore, this project uses relative compositional change to determine new sites rather than with absolute growth in Hispanic population, thus distinguishing itself from the work of Lichter et al. (2010).[12] As such, this project's classification scheme emphasizes compositional change and a distinction between new sites of settlement in the late 20th century and early 21st century.



(a) Using Data from 1990-2000 (b) Using Data from 1990-2013

FIGURE 3. Panel A is a map of Lichter's original county categorization using Census data from 1990 and 2000, while panel B is a map of Lichter's categorization adapted to Census data from 1990 to 2013.

[12] Lichter and colleagues use a classification scheme for new destinations, in which areas are chosen based on having a Hispanic population below the national average and growing by at least 200 Hispanics between 1990 and 2000.

Population Characteristics of 20th Century, 21st Century, and Established Sites

Hispanic composition. As expected, the overall concentration of Hispanic populations in established sites is significantly higher than in newer sites. Given that the pace of growth in 20th century sites slowed down after 2000 (per Figure 2), the higher concentration of Hispanics is likely the result of natural population growth (See Fischer & Tienda, 2006a).

Established sites mirror the expected race-ethnic distribution, with most of the population being Hispanic. In addition, they also have low concentrations of Non-Hispanic Black populations, on average. In fact, areas with the highest concentrations of Black Americans are largely distributed throughout southern states like Mississippi, Tennessee, Louisiana, and Alabama (Harshbarger & Perry, 2019),[13] which are home to 20th and 21st century sites. For example, the percentage of Non-Hispanic Blacks in 20th and 21st century sites is between 11 and 12 percent, which is approximately twice that of the concentration in established sites.

Foreign-born composition. Results in Table 2 indicate that newer sites are comprised of fewer foreign-born populations and more recent entrants compared to established sites. The results also suggest that the boom in the Hispanic composition of 21st century sites is the result of native-born Hispanics relocating from urban and established areas, given that they have fewer foreign-born residents, fewer Latin-

[13] In a report focusing on the rise of Black-majority cities in the U.S. Harshbarger and Perry (2019) detail the rise of quadrants of cities that have experienced growth in Black populations between 1970 and 2010. These quadrants are Boomtown, White Flight, Suburbanized, and Gentrified. Cities in the Boomtowns quadrant grew in both Black and non-Black populations, while White Flight cities gained Black populations but list non-Black, largely White populations. The final two quadrants both lost Black populations but Gentrified areas gained non-Black populations, whereas Suburbanized areas los non-Black populations as well.

Americans, and fewer English limited speakers than 20th century sites. Of the foreign-born population, the majority are from Latin America in all three sites. In established sites, 69 percent of foreign-born members are from Latin America, compared to only 61 and 52 percent in 20th and 21st century sites, respectively. As expected, fewer ratios of people in 20th and 21st CS are foreign-born at 15.57 and 10.35 percent, respectively, compared to 23.73 percent of the population in established sites.[14]

Area of origin. More evidence to suggest that 21st century sites are likely the result of both increased domestic *and* international migration in contrast to 20th century sites is evident from analysis of the origin countries of Hispanics in each site. Mexican-origin individuals comprise almost 80 percent of the Hispanic population of established sites, while only comprising 68 and 58 percent of 20th and 21st century sites, respectively. Approximately 14 and 10 percent of the Hispanic population in 21st Century Sites are comprised of Puerto Rican and Central American individuals, respectively. While Hispanic migration in the mid 20th century was largely marked by populations from Mexico, a result of labor and trade programs, the late 20th century and early 21st century was likely shaped more by natural disasters, and civil unrest, thereby contributing to increases in populations from Puerto Rico and Central American countries, respectively.

[14] Unfortunately, an omitted datum in our school district geocoded ACS data is the percent of the Hispanic population that is foreign-born. Therefore, I focus on the composition of the foreign-born.

TABLE 2. Population Composition of Sites

	Established Site	20th Century Site	21st Century Site	Non-Site, Some Hispanic	Non-Site, Few Hispanic
Race-ethnic Composition			Mean (SD)		
Hispanic	47.63 (0.19)	21.94 (0.11)	14.35 (0.14)	6.70 (0.03)	1.46 (0.01)
Non-Hispanic White	36.57 (0.18)	58.75 (0.17)	68.05 (0.28)	74.47 (0.10)	85.99 (0.17)
Non-Hispanic Black	5.97 (0.06)	11.93 (0.10)	11.42 (0.20)	11.67 (0.08)	8.67 (0.15)
Non-Hispanic American Indian	0.76 (0.04)	0.58 (0.02)	0.63 (0.03)	1.36 (0.03)	1.69 (0.08)
Non-Hispanic Asian	7.01 (0.08)	4.48 (0.05)	3.14 (0.06)	3.22 (0.03)	0.67 (0.01)
Non-Hispanic Hawaiian / Pac. Islander	0.19 (0.00)	0.17 (0.00)	0.12 (0.00)	0.15 (0.00)	0.03 (0.00)
Foreign-born Status					
Pct. Foreign-born	23.74 (0.11)	15.57 (0.07)	10.35 (0.10)	7.02 (0.03)	1.70 (0.02)
Pct. of Foreign-born from Latin America	68.92 (0.20)	60.74 (0.19)	52.38 (0.32)	37.77 (0.11)	25.89 (0.22)
Pct. of Foreign-born Entered U.S. after 2000	29.79 (0.08)	36.31 (0.09)	37.24 (0.21)	38.45 (0.08)	35.42 (0.21)
Pct. Foreign Born Entered U.S. After 2010	7.51 (0.04)	8.67 (0.05)	9.48 (0.10)	11.28 (0.05)	12.14 (0.14)
Pct. Spanish-Speaking, English-Limited	15.84 (0.09)	7.98 (0.05)	4.63 (0.07)	1.99 (0.01)	0.39 (0.01)
Pct. of Hispanic Population by Area of Origin+					
Mexican	79.64 (0.25)	67.50 (0.23)	57.79 (0.46)	56.43 (0.14)	56.37 (0.25)
Puerto Rican	1.93 (0.03)	9.37 (0.12)	13.94 (0.25)	15.01 (0.01)	15.15 (0.18)
Central American	6.20 (0.06)	7.96 (0.07)	10.46 (0.21)	9.15 (0.05)	6.99 (0.11)
South American	3.03 (0.04)	6.02 (0.07)	6.64 (0.13)	7.14 (0.04)	5.68 (0.10)
Cuban	2.77 (0.09)	3.25 (0.05)	2.54 (0.00)	3.01 (0.03)	3.18 (0.08)

N = 17,264 school districts sourced from the 2009-2013 5-year ACS estimates.

Education and Well-Being by Site

Educational attainment. Among Hispanics, those in 21^{st} centuries are most likely to have attained a bachelor's degree, followed by 20^{th} century and established sites. Perhaps most interesting is that while Hispanics in 21^{st} century sites are the most educated, Whites in 21^{st} century sites are the least educated compared to counterparts in other sites. Among non-sites, we see significantly more variation, with much higher educational attainment across identified race-ethnic groups in non-site, some Hispanics than in non-site, few Hispanics. Furthermore, the overall population in new sites is more likely to have attained a bachelor's degree, with no meaningful distinction between 20^{th} and 21^{st} century sites.

Economic well-being. Poverty rates vary significantly by site, with the highest rates of poverty for the general population and children in established sites. In comparison, 21^{st} century sites have the lowest rates of poverty. In addition to general well-being indicators, private school enrollment is included to demonstrate the overall level of participation in the public schooling system. There are slightly higher rates of private school enrollment in newer areas, particularly in 21^{st} century sites, which correlates with the lower rates of poverty in these areas.

TABLE 3. Education and Economic Well-being by Site

	Mean (SE)				
	Established 7uSite	**20th Century Site**	**21st Century Site**	**Non-Site, Some Hispanic**	**Non-Site, Few Hispanic**
Pct. with Bach. Degree or More	24.72 (0.11)	27.90 (0.11)	27.48 (0.16)	28.04 (0.07)	19.17 (0.08)
Pct. of Race-Ethnic Group with a Bachelor's Degree					
Hispanic or Latino	12.24 (0.07)	13.36 (0.08)	14.54 (0.17)	17.96 (0.07)	17.00 (0.18)
Non-Hispanic White	34.26 (0.13)	33.28 (0.13)	30.67 (0.17)	30.73 (0.07)	20.40 (0.09)
Non-Hispanic Black	21.38 (0.19)	20.78 (0.12)	20.83 (0.22)	20.50 (0.09)	14.04 (0.19)
Non-Hispanic Asian	45.44 (0.18)	45.74 (0.17)	45.14 (0.31)	46.79 (0.13)	40.76 (0.32)
Non-Hispanic Hawaiian / Pacific Islander	17.22 (0.21)	16.37 (0.19)	23.13 (0.51)	21.48 (0.19)	16.68 (0.63)
Some Other Race	9.97 (0.07)	10.68 (0.10)	10.23 (0.16)	15.64 (0.10)	16.46 (0.29)
Two or More Races	24.54 (0.13)	26.67 (0.14)	25.13 (0.25)	25.60 (0.09)	18.19 (0.19)
Well-Being					
Pct. in Lab. Force	62 .88 (0.06)	65.35 (0.05)	64.66 (0.10)	64.25 (0.03)	59.61 (0.07)
Pct. Employed in Civilian Labor Force	89.14 (0.03)	89.88 (0.03)	90.58 (0.05)	90.67 (0.02)	90.87 (0.04)
Pct. Poor	18.82 (0.07)	15.50 (0.06)	13.79 (0.09)	14.26 (0.04)	16.57 (0.07)
Pct. Poor < 18	26.00 (0.10)	22.24 (0.09)	19.68 (0.15)	19.73 (0.06)	23.26 (0.11)
Pct. in Private K-12	5.39 (0.03)	6.26 (0.03)	6.82 (0.05)	7.66 (0.02)	6.53 (0.04)

N = 17,264 school districts sourced from the 2009-2013 5-year ACS estimates.

School Characteristics of 20th Century, 21st Century, and Established Sites

Demographics and total per-pupil expenditure. Schools in 20th and 21st century sites have slightly higher cost-adjusted per-pupil expenditure and, on average, smaller in terms of student enrollment. The highest composition of Hispanic students in schools are in established sites. As expected given the trends of the population statistics in the earlier section, schools in established sites do not have high concentrations of Black students. Schools with the largest proportion of Black students are in 20th and 21st century sites. These results suggest that Hispanic students in established sites are much more likely to attend schools with other Hispanics. However, a stronger measure of segregation is warranted to determine whether this is accurate. In the next section, I explore segregation indices to better understand how students interact or are isolated from one another between schools.

TABLE 4. School-level characteristics

	Mean (SE)						
			Race-ethnic composition of schools				
	Cost-Adj. Per-Pupil Expenditures	School Size	American Indian	Asian	Hispanic	Black	White
Established Site	11,638 (164)	629.92 (4.54)	1.11 (0.05)	5.34 (0.09)	60.98 (0.24)	7.55 (0.12)	22.61 (0.19)
20th Century Sites	12,142 (303)	611.81 (4.18)	1.08 (0.04)	3.93 (0.06)	32.34 (0.20)	16.60 (0.19)	42.74 (0.24)
21st Century Sites	12,518 (109)	552.49 (6.10)	1.17 (0.06)	3.15 (0.07)	21.85 (0.26)	15.80 (0.30)	54.26 (0.39)
Non-Site, Some Hisp.	12,518 (58)	502.59 (1.89)	2.24 (0.05)	3.32 (0.03)	9.95 (0.06)	17.59 (0.12)	62.77 (0.14)
Non-Site, Few Hisp.	13,237 (51)	378.00 (2.56)	2.35 (0.11)	0.78 (0.02)	1.64 (0.02)	11.24 (0.21)	81.88 (0.23)

N=91,009 public schools, sourced from 2013 Common Core of Schools Data.

School-segregation. Isolation and interaction indices in Table 5 are used to assesses the extent of segregation within schools. Values close to zero indicate lower levels of interaction and isolation. The indices are all relatively close to zero which suggests low levels of interaction between Hispanics and Whites and low levels of isolation among Hispanics across all sites. However, some inferences are possible.

Hispanic students in 21st century sites are somewhat less likely to be segregated from White students, than even 20th century sites. Furthermore, Hispanic students are most likely to be isolated with other minority students in established sites. Given a higher percentage of White students in 21st century site schools (see Table 4), it is understandable that Hispanic students in 21st century sites are more likely to interact with White students than Hispanic students in 20th century sites and established sites. Furthermore, given that Hispanics are the least concentrated in 21st century site schools, it is also reasonable that they are the least likely to be isolated with other minority students.

TABLE 5. Isolation and Interaction Indices for School-Level Segregation by Site

	Mean (SE)				
Interaction Indices	**Established Site**	**20^{th} Century Site**	**21^{st} Century Site**	**Non-Site, Some Hispanic**	**Non-Site, Few Hispanic**
Hispanic – White	0.032	0.069	0.089	0.120	0.212
	(0.091)	(0.144)	(0.153)	(0.184)	(0.248)
Hispanic – Non-Hispanic	0.047	0.087	0.106	0.148	0.233
	(0.120)	(0.166)	(0.170)	(0.215)	(0.257)
Isolation Indices					
Hispanic	0.062	0.040	0.027	0.017	0.006
	(0.124)	(0.091)	(0.058)	(0.046)	(0.010)
Black	0.013	0.015	0.016	0.029	0.024
	(0.072)	(0.057)	(0.066)	(0.111)	(0.073)
Asian	0.006	0.005	0.003	0.005	0.003
	(0.021)	(0.021)	(0.008)	(0.020)	(0.008)
Districts	1,904	2,073	791	8,680	3,816

N=91,009 public schools, sourced from 2013 CCD data.

Discussion

The outcomes of Hispanics in new areas is subject to a variety of factors including, but not limited to, the background characteristics of the newcomers themselves, how they are perceived based on co-ethnic education and socioeconomic backgrounds, as well as the openness of institutions in these areas. of movement to these areas are.

Using relative compositional change and data that spans 1990 to 2013, this paper finds support for distinguishing between Hispanic settlement sites in 20^{th} century and 21^{st} century, in contrast to the extant literature in the field, which presumes that new Hispanic sites of settlement in the late 20^{th} century are similar to those settled in the 21^{st} century. Results from this study suggest that 21^{st} century sites are less impoverished, and more likely to be comprised more of native-born Hispanics relocating from other locations in comparison to 20th century sites. Furthermore, 21st century site Hispanics are more educated than their counterparts in other sites.

Factors unique to the last twenty years have likely shaped the rise of 21st century sites in ways distinct from the rise of 20th century sites. These include effects of the economic downturn of 2008 on the diasporic dispersion of Hispanics as well as the co-occurring rise of technology industries throughout the South and Midwest. The former likely drew many native-born Hispanics away from large urban cities to suburban centers in search of affordable housing and lower costs of living. In case studies of Charlotte, NC and Austin, TX, Smith and Furuseth (2008) and Skop and Buentellp (2008), find initial evidence of such movement. The rise of technological industries in some of these newest sites is likely contributing to a bifurcation of newcomers to 21st century sites, such that the booms in manufacturing are offset simultaneously by booms in high-income industries like technology. These two phenomena may be responsible for the socioeconomic differences in the Hispanic populations of 21st century sites in comparison to 20th century sites, as the results of this analysis indicate.

Schools in 21st century sites have lower concentrations of Hispanic students, spend more on students, and are slightly more integrated. These indicators may signal that schools in these areas are better prepared to respond to demographic than their counterpart schools in 20th century sites. However, some recent case studies offer insight into the potential futility of such efforts.

In a study of Wisconsin schools and how they have adapted to new Hispanic populations, Lowenhaupt (2010) found that schools attempted to address human capital, service delivery, and encourage social integration of new students and families. However, these responses were often rushed and struggled to sustain themselves past a few years. For example, efforts to ensure that Spanish-speaking families were offered interpretation and translation fell short of their intended goal to increase family participation via traditional mechanisms of schooling, such as participation in PTA meetings (Lowenhaupt, 2014). This lack of sustainability in initiatives is not unique.

In another study of Dalton, Georgia, Hamman and colleagues found that many initiatives which attempted to welcome new students, particularly ones who did not yet speak English via a comprehensive set of school- and community-based programs, ultimately failed (Hamann, 2002; Hamann et al., 2002). In the initial stages, to mobilize support for the project, advocates painted a deficit-based picture of the district which would require additional resources and services. This unwelcome truth about how most scholarship and policy attempt to garner support for immigrant and minority communities in the face of demographic change ultimately contributed to policies that are inherently more assimilative rather than affirming of the cultural, social, and linguistic backgrounds of students (Gibson, 1997; Lowenhaupt, 2016; Valenzuela, 1999). As Hamann argued, it is essential to respond to the growing Hispanic populations with a perspective that “educational change… be necessary, but not dire” (Hamann, 2003, p. 228).

While I focus on schools in this study, how *all* public institutions in these new Hispanic sites adapt to new populations will define the futures of these new sites. The dire circumstances forewarned by scholars who studied 20th century sites of settlement seem to be unwarranted. In particular, the distinguishing characteristics of 21st century sites of settlement indicate the need for a more nuanced picture of the diasporic dispersion of Hispanics throughout the United States.

Conclusion

Using a combination of data from the 1990 and 2000 decennial U.S. Census, the 2009-2013 ACS 5-year estimates geocoded to school districts and aligned Common Core of Data school-level information from 2013, this study sought to answer three research questions regarding the diasporic dispersion of Hispanics. They were as follows: (1) Where are the Hispanic sites of settlement in the late 20th century versus 21st century salient to school-aged populations? (2) What population and school district characteristics define these new sites? (3) How do the characteristics of public schools vary by site of settlement?

The novel categorization of Hispanic settlement sites developed in this paper illustrates that the factors that shaped international and domestic migration through the 1990s are likely different from the ones that shaped continued Hispanic movement to new sites throughout the 21st century.

First, 21st century sites are in geographically similar areas as 20th century sites, 21st century sites were more likely to be areas that had recently boomed in overall population, thus shifting from non-metropolitan to metropolitan areas. This is due to growth in both Hispanic and other minority populations including Asian immigrants. Furthermore, the Hispanic boom in 21st century sites was likely the result of native-born Hispanics relocating established sites in conjunction with foreign-born immigrants. The composition, then of 21st century sites, is such that Hispanics are less likely to be English-limited, and more likely to hold a bachelor's degree.

In addition to population composition, this paper found that the characteristics of public schools vary between these areas. In particular, the race-ethnic compositions of schools suggest that Hispanic students in 21st century sites are less likely to be segregated from White students, the dominant groups in their schools. Nonetheless, while schools in 21st century sites are still predominately White, their population composition is changing quickly, albeit comprised of different minority groups and status-levels than schools in 20th century sites.

The limitations of this study are primarily a result of the available information. Because I use school-district aligned data from the ACS 5-year estimates from 2009-13, the generally available information in ACS estimates is not available. For example, an inability to disaggregate employment, residential, and household information for Hispanics in each site limited the inferences I was able to make about population characteristics in this paper. Furthermore, the lack of school district geocodes for 1990 and 2000 limited the ability to draw inferences about how school districts, themselves would be categorized as established, 20th, and 21st century sites.

Nonetheless, this study contributes to the growing body of literature regarding new destinations and gateway cities by developing a classification that distinguishes between Hispanic movement that occurred between 1990 and 2000 and 2000 onwards. Furthermore, this project classification scheme emphasizes compositional change as the primary method of determining new sites of settlement, in contrast with prior work.

An Empirical Categorization Distinguishing between Era-Specific Migration Patterns

By distinguishing between settlement eras, this study demonstrates that site, population, and institutional characteristics of these sites vary, and consequently the implications of such demographic change.

Appendix

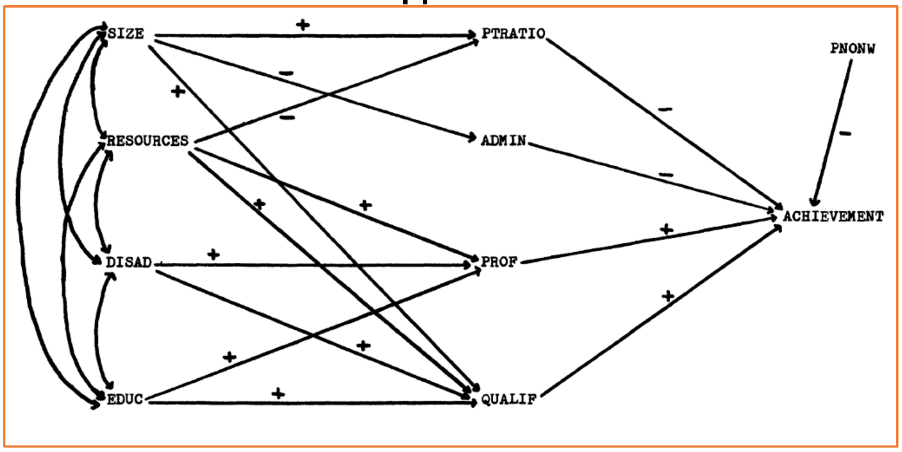


Figure A1. Model of school district organization and student achievement from Bidwell and Kasarda (1975). School size (SIZE), resources (RESOURCES), the percent of disadvantaged students (DISAD), and the education level of adults in the school district (EDUC) are the primary mechanisms by which school districts affect achievement. This occurs through school-level mechanisms, such as student-teacher ratio (PTRATIO), the ratio of administrator to classroom teachers (ADMIN), the ratio of professional support staff to teachers (PROP), and the percent of teachers how hold master's degrees (QUALIF). The district racial composition measured by percent non-white (PNONW) exogenously affects achievement. Reprinted from Bidwell & Kasarda (1975).

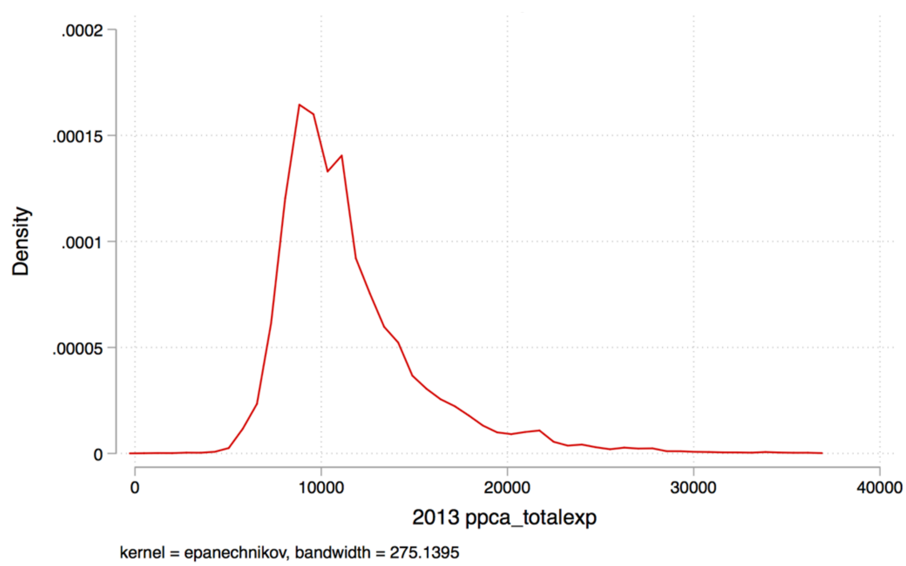


Figure A2. Kernel density estimates of per-pupil expenditures of overall school spending, 0 – 99th percentile, sourced from the 101,070 schools in the CCD, resulting in 91,009 schools. Using data from the CCD for all of the public schools in the nation, I develop a cost-adjusted measure for mean per-pupil expenditures, which uses an adjustment developed by the Bureau of Labor Statistics. To ensure a smooth distribution of mean per-pupil expenditure, of the 101,000 schools in the complete dataset, I drop schools with mean per-pupil expenditures in the top 1 percent and focus on schools within the 0 to 99 percentile expenditure distribution (See Figure A2 in the Appendix A). This process yielded 91,009 schools, which is a loss of approximately 10 percent of the public schools in the United States.

TABLE A1. County and 0-19 Aged Hispanic Population Distribution by Type of Site in 2013

	No. of Counties	Percent of All Counties	Average Percent of Hispanic Population, 0-19
Established Sites	219	6.99	45.76
20th Century Sites	281	8.97	22.41
21st Century Sites	150	4.79	14.75
Non-Site, Some Hisp. Sites	1,453	46.41	6.86
Non-Site, Few Hispanic Sites	1,028	32.83	1.50
Total	3,131	100.00	--

Note. Data is sourced from the 2009-2013 5-year ACS estimates, and Hispanic population estimates from 1990 and 2000 decennial U.S. Census. Designation based on 3,131 counties in the United States.

TABLE A2. Change in Classification of Counties between 1990 and 2013.

		Metropolitan Areas					Non-Metropolitan Areas			
		Large Central	Large Fringe	Medium	Small	Sub-Total	Micropolitan	Noncore	Sub-Total	
	Year	Number of Counties (Row %)								Total
		15	14	29	17	75	48	96	144	
	2013	(6.85)	(6.39)	(13.24)	(7.76)	(34.25)	(21.92)	(43.84)	(65.75)	219
Established		15	9	21	15	60	38	121	159	
Sites	1990	(6.85)	(4.11)	(9.59)	(6.85)	(27.40)	(17.35)	(55.25)	(72.60)	
		16	37	35	33	121	71	89	160	
20th	2013	(5.69)	(13.17)	(12.47)	(11.74)	(43.06)	(25.27)	(31.67)	(56.94)	281
Century		13	35	28	17	93	54	134	188	
Sites	1990	(4.63)	(12.46)	(9.96)	(6.05)	(33.10)	(19.22)	(47.69)	(66.90)	
		4	24	14	10	52	34	64	98	
21st	2013	(2.67)	(16.00)	(9.33)	(6.67)	(24.67)	(22.67)	(42.67)	(65.33)	150
Century		3	18	13	10	44	21	85	106	
Sites	1990	(2.00)	(12.00)	(8.67)	(6.67)	(29.33)	(14.00)	(56.67)	(70.67)	
		32	210	212	197	651	284	518	802	
Non-Site,	2013	(2.20)	(14.45)	(14.59)	(13.56)	(33.48)	(19.55)	(35.65)	(55.20)	1,453
Some Hisp.		31	150	198	108	487	253	713	966	
Sites	1990	(2.13)	(10.32)	(13.63)	(7.43)	(33.52)	(17.41)	(49.07)	(66.48)	
		1	82	82	100	265	204	559	763	
Non-Site,	2013	(0.10)	(7.98)	(7.98)	(9.73)	(25.78)	(19.84)	(54.28)	(74.22)	1,028
Few Hisp.		1	38	61	53	153	116	759	875	
Sites	1990	(0.10)	(3.70)	(5.93)	(5.16)	(14.88)	(11.28)	(73.83)	(85.12)	
		68	367	372	35	842	641	1,326	1967	
	2013	(2.17)	(11.72)	(11.88)	(11.40)	(26.89)	(20.47)	(42.35)	(62.82)	3,131
		63	250	321	203	837	482	1,812	2294	
Total	1990	(2.01)	(7.98)	(10.25)	(6.48)	(26.73)	(15.39)	(57.87)	(73.27)	

Note.. Data is sourced from the 2009-2013 5-year ACS estimates, and Hispanic population estimates from 1990 and 2000 decennial U.S. Census. Classification of metropolitan status are determined using the National Center for Health Statistics data systems scheme for urban-rural classification for counties.

TABLE A3. Number of Counties Per Site by State

	Sites										Total No. of Counties
	Non-Site, Few Hispanic		Established		20th Century		21st Century		Non-Site, Some Hispanic		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Alabama	31	46%	0	0%	4	6%	1	1%	31	46%	67
Alaska	9	33%	0	0%	0	0%	4	15%	14	52%	27
Arizona	0	0%	9	60%	3	20%	0	0%	3	20%	15
Arkansas	17	23%	0	0%	11	15%	1	1%	46	61%	75
California	0	0%	24	41%	14	24%	4	7%	16	28%	58
Colorado	4	6%	17	27%	11	17%	8	13%	23	37%	63
Connecticut	0	0%	0	0%	0	0%	1	13%	7	88%	8
Delaware	0	0%	0	0%	0	0%	1	33%	2	67%	3
D.C.	0	0%	0	0%	0	0%	0	0%	1	100%	1
Florida	5	7%	3	4%	17	25%	7	10%	35	52%	67
Georgia	41	26%	0	0%	24	15%	9	6%	85	53%	159
Hawaii	0	0%	0	0%	0	0%	0	0%	4	100%	4
Idaho	3	7%	0	0%	15	34%	0	0%	26	59%	44
Illinois	53	52%	0	0%	6	6%	4	4%	39	38%	102
Indiana	39	42%	0	0%	5	5%	1	1%	47	51%	92
Iowa	36	36%	0	0%	10	10%	3	3%	50	51%	99
Kansas	14	13%	3	3%	14	13%	11	10%	63	60%	105
Kentucky	66	55%	0	0%	0	0%	2	2%	52	43%	120
Louisiana	36	56%	0	0%	0	0%	0	0%	28	44%	64
Maine	15	94%	0	0%	0	0%	0	0%	1	6%	16
Maryland	2	8%	0	0%	0	0%	1	4%	21	88%	24
Mass.	1	7%	0	0%	1	7%	2	14%	10	71%	14
Michigan	33	40%	0	0%	0	0%	1	1%	49	59%	83
Minnesota	33	38%	0	0%	6	7%	1	1%	47	54%	87
Mississippi	60	73%	0	0%	0	0%	0	0%	22	27%	82
Missouri	77	67%	0	0%	3	3%	0	0%	35	30%	115
Montana	26	46%	0	0%	0	0%	0	0%	30	54%	56
Nebraska	28	30%	0	0%	11	12%	6	6%	48	52%	93
Nevada	0	0%	0	0%	7	41%	3	18%	7	41%	17
N. Hampshire	8	80%	0	0%	0	0%	0	0%	2	20%	10
New Jersey	0	0%	2	10%	2	10%	1	5%	16	76%	21
New Mexico	0	0%	30	91%	0	0%	0	0%	3	9%	33
New York	19	31%	4	6%	2	3%	4	6%	33	53%	62
North Carolina	6	6%	0	0%	22	22%	7	7%	65	65%	100
North Dakota	33	62%	0	0%	0	0%	1	2%	19	36%	53
Ohio	60	68%	0	0%	0	0%	0	0%	28	32%	88
Oklahoma	0	0%	1	1%	6	8%	8	10%	62	81%	77
Oregon	0	0%	1	3%	12	33%	4	11%	19	53%	36

Pennsylvania	40	60%	0	0%	3	4%	1	1%	23	34%	67
Rhode Island	1	20%	0	0%	1	20%	0	0%	3	60%	5
South Carolina	11	24%	0	0%	1	2%	2	4%	32	70%	46
South Dakota	41	62%	0	0%	0	0%	4	6%	21	32%	66
Tennessee	38	40%	0	0%	3	3%	2	2%	52	55%	95
Texas	0	0%	122	48%	47	19%	31	12%	54	21%	254
Utah	2	7%	0	0%	3	10%	4	14%	20	69%	29
Vermont	13	93%	0	0%	0	0%	0	0%	1	7%	14
Virginia	49	36%	0	0%	9	7%	8	6%	69	51%	135
Washington	0	0%	3	8%	8	21%	2	5%	26	67%	39
West Virginia	52	95%	0	0%	0	0%	0	0%	3	5%	55
Wisconsin	29	40%	0	0%	0	0%	2	3%	41	57%	72
Wyoming	1	4%	0	0%	1	4%	2	9%	19	83%	23
Total	1,032	33%	219	7%	282	9%	154	5%	1,453	46%	3,132

Note. Data is sourced from the 1990 and 2000 decennial Census and the 2009-2013 5-year ACS estimates. Sites are classified by county level.

TABLE A4. Number of Public Schools by State and Site

	Site Type					
	Non-Site, Few Hispanic	**Established**	**20th Century New**	**21st Century New**	**Non-Site, Some Hispanic**	**Total No. of Schools**
AK	129	-	-	3	337	469
AL	480	-	86	13	1,061	1,640
AR	159	-	242	23	705	1,129
AZ	-	823	1,416	-	242	2,481
CA	-	7,657	1,359	512	1,000	10,528
CO	14	473	416	205	723	1,831
CT	-	-	-	267	902	1,169
DC	-	-	-	-	246	246
DE	-	-	-	49	179	228
FL	43	580	1,908	476	1,383	4,390
GA	225	-	601	81	1,530	2,437
HI	-	-	-	-	288	288
IA	347	-	168	42	873	1,430
ID	16	-	223	-	549	788
IL	797	-	1,997	302	1,279	4,375
IN	450	-	114	231	1,159	1,954
KS	83	38	149	247	851	1,368
KY	628	-	-	21	947	1,596
LA	501	-	-	-	957	1,458
MA	8	-	152	234	1,475	1,869
MD	41	-	-	209	1,207	1,457
ME	591	-	-	-	38	629
MI	425	-	-	16	3,231	3,672
MN	555	-	90	25	1,799	2,469
MO	918	-	39	-	1,473	2,430
MS	662	-	-	-	424	1,086
MT	266	-	-	-	569	835
NC	55	-	833	105	1,670	2,663
ND	253	-	-	14	279	546
NE	151	-	143	225	584	1,103
NH	280	-	-	-	208	488
NJ	-	284	144	175	2,027	2,630
NM	-	800	-	-	122	922
NV	-	-	572	50	67	689
NY	403	1,680	327	471	1,944	4,825
OH	1,706	-	-	-	2,105	3,811
OK	-	3	266	284	1,246	1,799
OR	-	24	547	95	611	1,277
PA	1,265		231	69	1,665	3,230
RI	12	-	188	-	111	311
SC	142	-	6	42	1,069	1,259
SD	378	-	-	44	301	723
TN	373	-	39	169	1,258	1,839

TX	-	4,411	2,823	688	1,365	9,287
UT	14	-	415	32	587	1,048
VA	417	-	195	76	1,516	2,204
VT	313	-	-	-	6	319
WA	-	155	303	44	1,922	2,424
WI	487	-	-	64	1,737	2,288
WV	710	-	-	-	57	767
WY	6	-	11	40	309	366
Total	14,303	16,928	16,003	5,643	48,193	101,070

Note: Data is sourced from the 2009-2013 5-year ACS estimates and 2013 CCD. Sites are classified by county level, but units reported in this table are all public schools in the nation

Chapter 3

Place and Student Achievement

Abstract

The rapid growth of the U.S. Hispanic population and dispersion to new, less traditional areas across the United States has driven interest in how students fare academically in these places. This study determines whether place, as determined by the recency and concentration of Hispanic population has a special effect on the achievement of Hispanic students. Using comprehensive, nationally representative math achievement data at the middle and high school levels, this study finds that the effect of place on achievement varies between places. Therefore, in certain areas, the impact of place-based characteristics matters more than in other areas. Furthermore, the study finds that 8^{th} grade students in newer areas perform better than in traditional areas. This effect does not hold by 12^{th} grade, however, in which students in the newest or most recently settled areas underperform relative to their peers.

Introduction

The dramatic growth and dispersion of the U.S. Hispanic population since 1990 to areas outside of traditional states and counties has spurred concern about how students fare in these new areas among researchers, policymakers, and community leaders. Scholars who have studied the development of these new areas have warned of the dire consequences associated with rapid demographic change on student achievement and outcomes, particularly in the ways that schools are able to accommodate students' needs. In this paper, I study the relationship between place and Hispanic student achievement, by evaluating the effects of sites of Hispanic settlement on student achievement.

The primary motivation for this study is the opportunity to separate the effects of place-based institutions and context on student achievement. The extant literature regarding Hispanic student achievement is in traditional or established places, such as Miami, New York, and Los Angeles due to the large concentrations of Hispanic students. While this research has served as the foundation of decades of policies and practices regarding Hispanic education, it has not grown to consider the phenomenon of post-1990 Hispanic movement into newer areas. Studying Hispanic student outcomes solely in the context of established areas is mired by the co-occurring effects of ethnic enclaves, networks, and institutional supports, all of which are more prevalent in established sites. In contrast, newer areas likely lack these co-ethnic institutions, communities, and networks.

A secondary motivation for this study is based on the dearth of recent and generalizable literature regarding the achievement outcomes of Hispanic students. Existing analysis of the achievement of Hispanic students is often constrained by small sample sizes. In this study, I use data from the National Assessment of Educational Progress (NAEP), which is a large nationally representative dataset of student achievement that allows for the ability to analyze Hispanic student achievement across the nation.

To study the effect of place on Hispanic student achievement, I use a novel classification of new Hispanic sites that distinguishes between areas that were settled in the late 20th century and early 21st century (Chunduru, 2020b). In addition to these sites, areas that have retained large concentrations of Hispanics over many decades are categorized as established sites. Areas that have a small and consistent population of Hispanic students are "non-sites," with either *some* Hispanics or *few* Hispanics. Figure 1 below illustrates how these counties or sites are dispersed throughout the United States.[15]

The results of this study indicate the need for greater nuance about the role of place in student achievement. In newer sites, 8th grade students outperform their counterparts in established areas. These effects, however, do not extend to 12th grade student achievement. In fact, 12th graders in newer sites significantly underperform in comparison to their peers in established sites. Distinguishing between 20th and 21st

[15] In prior work, I found that 21st century sites are comprised of more advantaged populations than 20th century sites and established sites (Chunduru, 2020b). In addition to a number of differences in site-level characteristics, I found that newer sites, on average, were less impoverished than established sites.

century sites in this study is critical to determining how site maturity and school characteristics affect student achievement. Thus, the concern about Hispanic students' achievement in new areas may be justified for older students, but not necessarily so for middle school students. These results, then, indicate that secondary schooling might be responsible for the lower relative achievement of 12th graders in newer Hispanic areas.

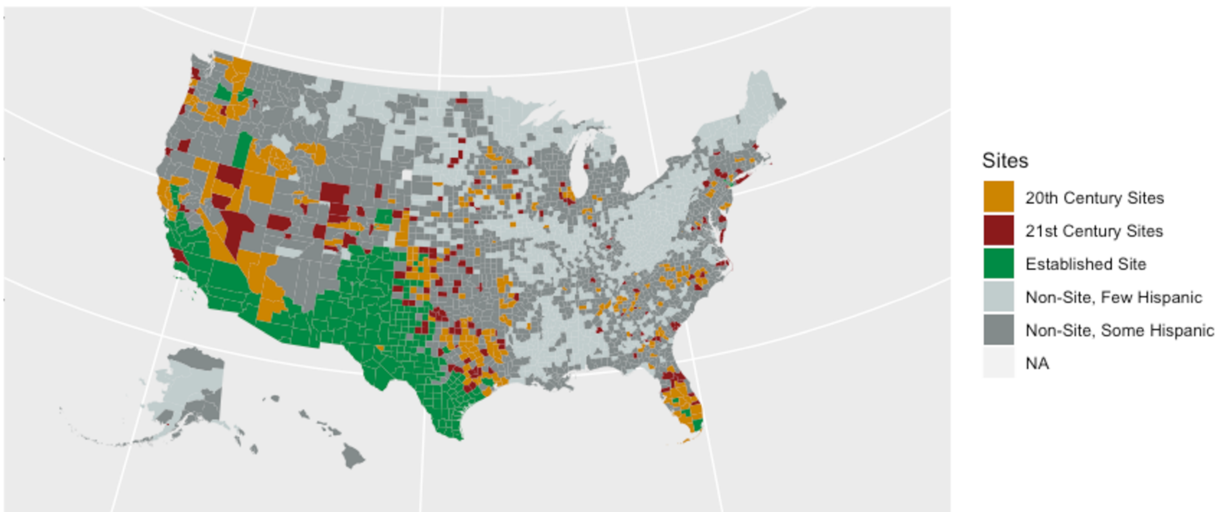


FIGURE 1. This project's categorization of sites of Hispanic settlement uses Census data between both 1990-2000 and 2000-2013. There were no areas that were both 20th and 21st Century Sites. This classification uses school-aged Hispanic population, e.g. of 0-19 years, instead of the general Hispanic population as well as percent growth rather than absolute growth in population.

Prior Research on Hispanic Student Outcomes and Site Mechanisms

Place-Based Variation in Hispanic Student Outcomes

The extant body of sociological literature regarding the effects of social capital, immigrant advantage, and co-ethnic composition on Hispanic students has focused on students in established sites (See, for example, Hao & Bonstead-Bruns, 1998; Portes & Hao, 2002, 2004; Stanton-Salazar, 1995, 1997, 2010; Stanton-Salazar & Dornbusch, 1995). Despite warnings by scholars such as Lichter et al. (2010), who caution us about the impending academic crisis to take place in new sites of settlement, actual research regarding student outcomes in new sites is sparse.

The existing evidence regarding educational attainment in newer vs. established areas yields mixed results. For example, Ackert and colleagues found evidence of lower levels of early childhood enrollment (Ackert et al., 2019) and lower levels of high school completion (Ackert, 2017) among students of Mexican origin in newer areas compared to established areas (See also Fischer, 2010). Yet, an earlier study conducted by Stamps and Bohon (2006) found evidence that Hispanic educational attainment in newer areas was significantly higher than in traditional areas. These contradictions occurred due to variation in the definitions of new sites, themselves. For example, Ackert (2017) defined “new destinations” by both state and local profiles, via Census PUMA files to account for state-level policy variation. In contrast, Ackert et al. (2019) used counties as the primary geographic unit. Furthermore, Stamps and Bohon (2006) used a classification developed by Suro and Singer (2002) which only focused on the 100 largest metropolitan areas.

In contrast to findings regarding educational attainment, the few studies that evaluated achievement by site yielded relatively consistent findings. Potochnick (2014) found that students achieved at higher levels in new areas, and a later study by Spees, Potochnick, and Perreira (2016) found that this advantage is particularly salient for Limited English Proficient (LEP) students. Similarly, in a state-wide analysis, Clotfelter et al. (2012) found that Hispanic students in North Carolina who arrived by the age of nine “close[d] the achievement gap” with socioeconomically similar white students by

6th grade in the same area. However, the use of administrative data of students who remained in North Carolina over the course of their schooling rendered this study relatively ungeneralizable. This issue is extenuated by the high levels of mobility associated with immigrant populations, particularly in new destinations (See, for example, Kritz, Gurak, & Lee, 2011).

Site-Level Mechanisms Related to Hispanic Student Achievement

Although studies about the achievement of Hispanic students yield more consistent findings, they define new sites as areas in which Hispanic growth boomed between 1990 to 2000. We know little about areas that were settled after 2000 by Hispanics and how student achievement fares in these areas. To consider which mechanisms might be salient for affecting achievement in 21st century sites, I glean insights from a significant body of work focused on mechanisms unique to 20th century sites, referred to as “new destinations” in the existing literature.

Social and Residential Segregation

The social and residential integration of Hispanics is integral to understanding the effects of place on achievement. While one branch of demographers led by Lichter and colleagues found that Hispanics in new areas, particularly immigrants, were more economically vulnerable and more likely to be segregated from non-Hispanic whites than their counterparts in established areas (See also Fischer & Tienda, 2006a; Hall, 2013; Lichter et al., 2010), other research including work by Alba et al. (2010) and Park and Iceland (2011) found that Hispanics are less segregated from non-Hispanic whites in newer areas than in traditional areas.

The contrasting findings regarding Hispanic segregation can be distilled to two competing explanations. Greater levels of Hispanic segregation in newer areas could be the result of the economic inequality caused by new industries in these areas. These industries may simultaneously Hispanic growth and contribute to a segmented labor market, which would make socioeconomic upward mobility in new areas unlikely as Lichter et al. (2010) denoted. For example, the authors predicted that even if Hispanics achieved upward social mobility, there was little guarantee that this would translate to greater inclusion into dominant society via residential and schooling incorporation. Furthermore, the authors noted that despite lower concentrations of Hispanics, the perception that Hispanic immigrants were “threats” to the majority white populace may contribute to racial marginalization. In agreement with Lichter et al. (2010), other scholars warned that this trend in the marginalization of Hispanics may be more pronounced in communities in which there are segmented housing markets, thus yielding few options for low-income families (See, for example, Fischer & Tienda, 2006b; Hall, 2013).

The competing explanation that may explain findings that suggested Hispanics in new areas are less likely to be segregated arises from the concept of heterolocality, e.g. a greater likelihood of settling in areas that are not comprised of co-ethnics. Case studies focused on specific sites particularly in the Southern United States found that Hispanics in newer areas are less likely to be segregated from White communities due to heterolocality (See, for example, Skop & Buentellp, 2008; Smith & Furuseth, 2008).

Co-ethnic Effects

Ethnic enclaves are endemic in the study of Hispanic student outcomes, particularly the extent to which they protect immigrant students from hostility in new areas (See, for example, Portes & MacLeod, 1996; Portes & Rumbaut, 2001; Warikoo & Carter, 2009). Lichter, Sanders, et al. (2015) argued that new areas are less likely to be home to the ethnic enclaves, support structures, and co-ethnic networks, which characterize established areas. Thus, there might be fewer opportunities for intergenerational socioeconomic mobility in new destinations, which the authors argued may contribute to a higher likelihood that Hispanic newcomers in new areas may suffer from a permanent “otherness”

In addition to the networks and support offered by ethnic enclaves, co-ethnic status may shape how newcomers are perceived by the existing community as well as access to resources and services. For example, Hao and Kawano (2001) theorized that co-ethnic status affects the stigma associated with accessing welfare. Within education, this type of stigma might extend to the types of resources that students and families have access to. In prior work, I found that Hispanics in 21st century sites are more educated, on average, than their counterparts in 20th century sites. Furthermore, Hispanics in *both* sites are more likely to be educated than Hispanics in established sites (See Chunduru, 2020b). This difference in co-ethnic educational status by area might shape how students are perceived by their schools and teachers, which might influence their educational opportunities.

School-Level Mechanisms

School Resources

A long history of research indicates that public schools are funded and resourced unequally based on the racial, ethnic, and socioeconomic composition of the school and surrounding areas (Baird, 2008; Baker, 2014; Baker, Sciarra, & Farrie, 2014; Darling-Hammond, 2000). However, the strength of the association between unequal resourcing and student outcomes is much more contested. Significant literature has found that teacher experience, class size, and course offerings are weakly associated with long-term educational attainment, but not necessarily short-term achievement (See, for example, Card & Krueger, 1992, 1996; Greenwald, Hedges, & Laine, 1996; Hedges, Laine, & Greenwald, 1994; S. Morgan & Jung, 2017). This literature suggests that school resources and funding are necessary, but not sufficient for influencing students' long-term outcomes, given the conflation between family characteristics and school characteristics via school sorting.

More recent literature has considered how schools adapt to changing demographics. But, conflicting evidence abounds. Dondero and Muller (2012) found, for example, fewer support services for English language learners in new areas than in established areas. In contrast, Potochnick (2014) found that schools in newer areas adapt to students in ways that support learning better than schools in established areas. In a survey analysis of Wisconsin schools that experienced growth in Hispanic students, Lowenhaupt (2016) found that suburban schools more than urban schools were more likely to offer opportunities for integrating schools such that second-language English speakers had greater access to core academic classes and native English speakers. However, there is little evidence that these policies persisted beyond their initial implementation period (Frankenberg as cited in Lowenhaupt, 2016).

School Segregation

In contrast to school resource literature, the overwhelming body of work related to the effects of concentrated poverty and the associated disadvantages finds continued negative short- and long-term on student outcomes. In one of the most recent evaluations of this effect, Reardon, Weathers, Fahle, Jang, and Kalogrides (2019) used data from all public school districts and found that racial school segregation is still strongly associated with differences in the achievement of students in 3rd grade as well as the pace at which this difference grows from 3rd to 8th grade. Furthermore, the phenomenon of "resegregation," a response from White communities to increasing demographic change in public schools is likely to shape the future of public schooling. Diem and Frankenberg (2013) credited this phenomenon to a post-1990 decline in legal and political foci regarding the creation and maintenance of segregated schools.

Beginning in the 1980s, research suggested that while Hispanic segregation rose across the nation (Arias, 1986), it did not mirror that of the extreme segregation that African-American students have faced (Denton, 1995; Denton & Massey, 1988). In contrast to African-American segregation, Hispanic segregation, when present, is largely determined by nativity and generational status, rather than ethnicity, alone (Denton & Massey, 1988). However, the prevalence of Hispanic segregation in new sites is less understood. Lichter et al. (2010), for example, found that Hispanic students in new areas are less likely to be segregated by schools than in established areas, due to smaller concentrations. Similarly, Reardon et al. (2000) found that rising residential segregation in metropolitan cities contributed to rising segregation between White and non-White students. In contrast, Fry (2011) found that Hispanic students in 30 new settlement areas were not necessarily more integrated than in established sites, such that 54 percent of Hispanic students attended majority-minority schools, in comparison to only 11 percent of their White peers.

Individual Mechanisms

Sociocultural explanations dominate scholarship about the educational outcomes of Hispanic students. Generational status of immigrants is often used as an indicator of certain affects and worldviews of students. For example, high levels of "immigrant optimism" among first-generation immigrants is credited for higher levels of achievement in comparison second-generation peers who may have lower levels of positivity towards their futures (See, for example Kao & Tienda, 1995; Suarez-Orozco, Suarez-Orozco, & Todorova, 2008).

In addition, the role of familism, which Sabogal, Marin, Otero-Sabogal, VanOss, and Perez-Stable (1987) defined in their seminal work, as family obligations, perceived support from family, and family as referents is used to explain lower levels of educational attainment among Hispanic students. In an adaptation of this work to new site literature, Spees, Perreira, and Fuligni (2017) found no variation in family encouragement to do well in school between traditional and new areas. However, the authors also found that immigrants in newer areas are "protected" from lower educational expectations and GPAs by a positive family and school environment, despite students in newer areas perceiving discrimination at higher levels.

Although sociocultural explanations have played a significant role in Hispanic achievement and educational attainment literature, the individual mechanisms of most interest to this study are family background, particularly parental educational attainment and socioeconomic status. Like other groups of students, the educational attainment of Hispanic students is partially explained by parental education (Feliciano, 2017). Furthermore, some evidence suggests that the transmission of this advantage between parents and children does not vary by nativity (Alon, Domina, & Tienda, 2010).

Nonetheless, studies focused on the effects of parental background do not necessarily consider the interactive role of place, particularly because of the unique drivers of migration to different sites. While the drivers of migration to 21st century sites is not as developed, we know, for example, that Hispanic growth in 20th century sites is the result of low-skill, low-wage employment (Parrado & Kandel, 2008a). Furthermore, the primary source of new residents in these areas are foreign-born residents (Johnson & Lichter, 2016). Many studies have found that that Hispanic immigrants are less educated, have fewer job skills, and are more likely English language limited than native-born Hispanics and native-born Whites in new areas (Donato, Tolbert II, Nucci, & Kawano, 2007; Jensen, 2006; Kandel & Cromartie, 2004). In contrast, in prior work, I found that newer sites are comprised of more educated Hispanics and fewer English limited speakers (See Chunduru, 2020). The causes of these discrepancies is likely simply a result of delineation between native-born Hispanics and Hispanic immigrants. Nonetheless, individual background is critical to consider within the context of place.

Method

Data

I use 8th and 12th grade math achievement data from the 2013 National Assessment of Educational Progress (NAEP) to study the effects of site on achievement. The NAEP is administered every few years to students across the nation and schools participate in either math or reading subject tests, but not both. NAEP also samples schools at the state and national level, such that public schools are selected to be representative of each state. These schools are then aggregated to form a national sample.[16]

Within schools, students are selected via simple random sampling, which yields approximately 150 students per grade per subject. This varies by the size of the school.[17] The analytic sample for 8th grade (N = 153,148) and 12th grade (N = 41,940) public school students is developed using single imputation of background characteristics, and listwise deletion of missingness on school- and site-level covariates,

[16] Non-public schools, however, are sampled only at the national level and are representative of non-public school students, nationwide. Schools in NAEP are selected using probability proportional-to-size (PPS) method, in which school size determines the probability to selection. For example, larger schools have higher probabilities of being selected. Prior to sampling, the schools in each district are sorted by characteristics such as urbanicity, race and ethnic composition, prior achievement, and the median household income of surrounding areas.

[17] While NAEP ensures accommodations for students with disabilities or who are English language learners, they are not oversampled. Furthermore, other minority groups such as students of color are not oversampled. Finally, students who are severely English language limited or disabled are not required to take the assessment despite being sampled. This is often at the school's discretion, but NAEP offers estimates of this occurrence which provides some opportunity to account for this sampling error.

which cannot be imputed. This maintains approximately 88.5 and 88.3 percent of the complete 8th and 12th grade samples, respectively.

I combine this 2013 NAEP data with school-district level data from the 2009-2013 American Community Survey (ACS) 5-year estimates and public-use school-level data from the 2013 Common Core of Data. The ACS estimates are sourced from the Missouri Census Data Center.[18] This combined dataset allows for the analysis of the effect of place on achievement, while accounting for site, school, and individual mechanisms.

Measures

Sites

Sites in this project are developed in the tradition of Lichter et al. (2010).[19] I use a site classification system that uses compositional change in the school-aged (0-19 years) Hispanic population between 1990 and 2000 and between 2000 and 2013 to develop three types of sites (See Chunduru, 2020b). Established sites are areas home

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[18] Beginning in 2009, the Education Demographic and Geographic Estimates (EDGE) division of the U.S. Census Bureau began offering ACS estimates bounded by the geographic boundaries of school districts. However, the most comprehensive and recent adaptation of ACS estimates to school district boundaries was curated from the Missouri Census Data Center for 2009-2013. Thus, I use this set of data over the EDGE estimates from later years as it contains a wealth of ACS estimates.

[19] Per Lichter et al. (2010), new destinations are essentially areas which had small Hispanic populations in 1990 and experienced rapid growth over the following decade. These areas include central cities, metro suburban places, and nonmetro places. Counties in which the Hispanic population was less than the national percentage (9%) in 1990 and experienced a growth of at least 200 Hispanics between 1990 and 2000 were labeled as new Hispanic destinations, which yielded 257 counties. Of these, 26 were metro central cities, 160 were metro suburban places, and 71 were non-metro places. Ultimately, Hispanics in new destinations accounted for only 1.2% of the total U.S. Hispanic population in 2000. Although more simplistic categorizations persist (See, for example, Dondero & Muller, 2012; Fischer, 2010), to situate this study within the extant literature, I build on the methods developed by Lichter et al. (2010), which most other research in the field uses. Lichter et al.'s school districts matched with their corresponding counties which yields 459 of the 889 school districts as established, new, and other Hispanic destinations.

to large concentrations of Hispanics prior to 1990.[20] Counties that experienced rapid growth between 1990 and 2000 are classified as 20th century sites. These are areas largely in concert with the new destinations developed by Lichter et al. (2010). Counties which experienced rapid growth *only* between 2000 and 2013 are designated as 21st century sites.[21] Of 3,143 counties, 247 counties experienced rapid growth in both the 20th and 21st centuries. These 247 sites were designated as 20th century sites and *not* 21st century sites because they were first sites of settlement in the earlier era and persisted in their growth over the next era.

Student Achievement

I use the average composite math scores of 8th and 12th graders in the 2013 NAEP, which is constructed from several sections including data analysis, algebra, and geometry. Using both 8th and 12th grade achievement offers a more expansive perspective on student achievement. For example, the likelihood of being pushed out of school may be more likely for Hispanic students who are unauthorized and are therefore subject to sociopolitical and environmental constraints.

Student achievement is the key outcome of interest in this project two reasons. First, Hispanic students, many of whom may be undocumented, face sociopolitical barriers to postsecondary education, which may prevent students from attending and completing high school (Gonzales, 2010, 2011). Second, a variety of mechanisms

[20] These are counties in which the 0-19 aged population was larger than twice the mean of the national average in 1990 which was 12.22 percent are designated as established sites.
[21] 20th century counties are areas that grew by at least the overall mean of growth in the 0-19 aged population plus at least one standard deviation between 1990 and 2000. 21st century sites are classified similarly using growth between 2000 and 2013.

outside of the control of schools and districts may determine college enrollment including parental support (Perna & Titus, 2005; Rowan-Kenyon, Bell, & Perna, 2016; Stage & Hossler, 1989), financial capacities (Kane, 2003; Linsenmeier, Rosen, & Rouse, 2006; Perna, 2006), access to information about college (Bell, Rowan-Kenyon, & Perna, 2016), and state and policy contexts (Bell et al., 2016; Perna & Titus, 2004). These outside influences are particularly strong for low-income students with effects diminishing for students as family income increases (Kohn, Manski, & Mundel, 1976; Linsenmeier et al., 2006). This study, which focuses solely on the effects of site on achievement allows for a clearer focus on the role of school and site mechanisms in this relationship.

Site-Level Covariates

Site-based mechanisms most likely to shape the outcomes of Hispanic student achievement include social and residential segregation, economic parity, and co-ethnic effects. Available proxies for each of these mechanisms from the ACS are used as covariates. Unfortunately, the school-district aligned measures from the ACS do not contain unemployment and poverty measures by race-ethnic groups. Therefore, I include the overall well-being of the population in the site to offset specific measures associated with Hispanic as well as economic parity and residential segregation. These measures are *percent unemployed* and *percent poor*. Co-ethnic effects are measured by the educational attainment of Hispanics via the *percent of Hispanics or Latinos with a bachelor's degree or higher* and the percent of the population that is *Spanish-speaking and English limited.*

School-Level Covariates

School-level mechanisms most likely to influence student achievement are school-level resources and segregation. I represent these factors using variables from the CCD and NAEP. As a measure of segregation, I use co-ethnic composition, e.g. the *percent of the school that is Hispanic*, information available in the CCD. As a measure of school resources, I use a *cost-adjusted measure of per-pupil spending* from the CCD (I use cost of living and urbanicity data from the Bureau of Labor Statistics to develop this measure). As proxies for overall school resources such as teacher quality, I use a binary indicator of whether more than *5% of teachers are absent on an average day*. As a proxy for teacher experience, a component of school-level resources, I use the *percent of teachers who have taught math for over 10 years* and for 8th grade analysis, and a binary indicator of whether *teacher retention of non-tenured teachers is higher than 90%* for 12th grade analysis, given the different available information in the NAEP for each grade level.

Individual-Level Covariates

As a proxy for the sociocultural components associated with Hispanic student achievement, I use a binary NAEP-provided indicator of whether the *student's parents talked to them about their studies*. To measure socioeconomic status, I use a combination of dichotomized covariates drawn from a student survey administered during the NAEP. These include the *number of books in a child's home*, which is dichotomized to fewer and greater than a hundred books in the home and whether the student has *access to a computer* at home. Finally, I include two indicators of whether the *student's mother and a student's father has a college degree* as a measure of the generational transmission of privilege.

Analysis

The research questions for this paper are as follow: (1) What is the effect of site, e.g. the recency of settlement area, on Hispanic student achievement? (2) To what extent do individual-, school-, and site-level mechanisms help explain this effect? I begin with a descriptive means analysis of students' background characteristics. Then, I test a series of nested regression models which estimate the marginal effect of site on Hispanic student achievement. Although these models focus on the interaction between site and race-ethnicity, given the inclusion of all students in this analysis, I focus solely on the marginal effects of site on Hispanic students, only. To determine the marginal effect of a sites on Hispanic student achievement, I use interaction models which suggest that the effect of a change in site on achievement depends on the value of the conditioning variable, which in this case is race. The equation for the interaction model is as follows:

$$Y = \beta_0 + \beta_1 Site + \beta_2 Race + \beta_3(Site\ x\ Race) + X\beta_4 + W\beta_5 + Z\beta_6 + \epsilon, \qquad (3)$$

where Y represents the average composite math score. *Site* and *Race* are mutually exclusive categorical indicators of a student's location and their race or ethnicity. The vectors *X*, *W*, and *Z* represents a combination of individual-, school-, and site-level covariates. The marginal effect of site on achievement for Hispanic students can be represented by the derivative below.

$$\frac{\partial Y}{\partial Site} = \beta_1 + \beta_3(Race) \qquad (4)$$

In order to calculate the significance of the marginal effect, I calculate a pooled standard error, as expressed below, which determines the significance of the combined effect of site on achievement for Hispanic students, in particular $(\beta_1 + \beta_3)$.[22]

$$\hat{\sigma}_{\frac{\partial Y}{\partial Site}} = \sqrt{var(\hat{\beta}_1) + (Race^2)(var(\hat{\beta}_3)) + 2(Race)(cov(\hat{\beta}_1\hat{\beta}_3))} \qquad (5)$$

Results

Descriptive Analysis

A means analysis of the background characteristics of Hispanic 8th and 12th graders in this sample reveals that Hispanic students are relatively more advantaged in newer sites, with 21st century sites in the lead. These results are strongest and most consistent for 12th graders (See Tables 1a and 1b). For example, in 20th century sites, 8th grade Hispanic students have higher rates of access to a computer and are more likely to talk about their studies with parents. These results suggest evidence of a 21st century site advantage for Hispanic students, followed by students in 20th century sites, and finally students in established sites. These results align with the overall sample of all students.

The school characteristics of the 8th and 12th grade NAEP samples, displayed in Tables 2a and 2b, demonstrate a clear 21st century site advantage for Hispanic students. The schools of 8th grade Hispanic students, on average, have much higher per-pupil expenditures, lower rates of free and reduced-price lunch students, and more

[22] For a thorough explanation of this method, see the discussion on assessing the significance of interactions ins Brambor, Clark, and Golder (2017).

experienced teachers in 21st century sites than other sites. Similarly, the schools of 12th grade Hispanic students have much higher per-pupil expenditures and have lower rates of student poverty and higher levels of teacher tenure. Furthermore, 20th century site schools are not necessarily more advantaged than established site schools. For example, per-pupil expenditures, teacher experience, and teacher tenure are all lower in 20th century sites than in established sites.

Site-level characteristics in Tables 3a and 3b indicate that 21st century sites across the board have higher levels of educated Hispanics, lower levels of unemployment, poverty, and English limited speakers. When the sample is narrowed to just Hispanic students, this advantage holds. 20th century sites are situated in between established and 21st century sites. There is a slight difference in Hispanic education levels between established and 20th century sites. These results confirm that 21st century sites are more advantaged in terms of overall site and population characteristics, particularly as it relates to co-ethnic effects.

TABLE 1a. Background Characteristics of 8th Grade Math Students in NAEP by Destination Site

	Cell Size	More than 100 Books in Home	Access to Computer	Talks about Studies with Parents	Mother Has College Degree	Father has College Degree
All Students						
Established Sites	18,180	0.186 (0.003)	0.899 (0.002)	0.600 (0.004)	0.296 (0.003)	0.257 (0.003)
20th Century Sites	23,637	0.229 (0.003)	0.915 (0.002)	0.602 (0.003)	0.378 (0.003)	0.322 (0.003)
21st Century Sites	7,081	0.237 (0.005)	0.925 (0.003)	0.584 (0.006)	0.412 (0.006)	0.338 (0.006)
Non-Site, Some Hispanic	82,404	0.278 (0.002)	0.930 (0.001)	0.606 (0.002)	0.447 (0.002)	0.374 (0.002)
Non-Site, Few Hispanic	21,846	0.255 (0.003)	0.920 (0.002)	0.575 (0.003)	0.423 (0.003)	0.324 (0.003)
Total	153,148	0.246 (0.001)	0.920 (0.001)	0.600 (0.001)	0.400 (0.001)	0.334 (0.001)
Hispanic Students						
Established Sites	11,927	0.104 (0.003)	0.870 (0.003)	0.573 (0.004)	0.186 (0.004)	0.149 (0.004)
20th Century Sites	9,329	0.103 (0.003)	0.878 (0.003)	0.548 (0.005)	0.191 (0.004)	0.147 (0.004)
21st Century Sites	1,697	0.126 (0.008)	0.867 (0.008)	0.530 (0.012)	0.238 (0.011)	0.178 (0.010)
Non-Site, Some Hispanic	12,142	0.170 (0.003)	0.893 (0.003)	0.544 (0.004)	0.276 (0.004)	0.220 (0.004)
Non-Site, Few Hispanic	1,306	0.219 (0.011)	0.906 (0.008)	0.510 (0.013)	0.332 (0.013)	0.270 (0.013)
Total	36,401	0.123 (0.002)	0.878 (0.002)	0.557 (0.003)	0.214 (0.002)	0.170(0.002)

N = 153,148 students.
Note*.* Means or proportions are shown with standard errors in parentheses. Data are single-imputed. Data are weighted by the NAEP-provided comprehensive weight, *origwt.*

TABLE 1b. Background Characteristics of 12th Grade Math Students in NAEP by Site

	Cell Size	More than 100 Books in Home	Access to Computer	Talks about Studies with Parents	Mother Has College Degree	Father has College Degree
All Students						
Established Sites	3,692	0.202 (0.007)	0.909 (0.005)	0.611 (0.008)	0.272 (0.007)	0.244 (0.007)
20th Century Sites	5,887	0.245 (0.006)	0.927 (0.003)	0.589 (0.006)	0.337 (0.006)	0.285 (0.006)
21st Century Sites	2,268	0.270 (0.009)	0.932 (0.005)	0.611 (0.010)	0.373 (0.010)	0.325 (0.009)
Non-Site, Some Hispanic	22,602	0.316 (0.003)	0.939 (0.002)]	0.612 (0.003)	0.429 (0.003)	0.369 (0.003)
Non-Site, Few Hispanic	7,491	0.261 (0.005)	0.926 (0.003)	0.580 (0.006)	0.414 (0.006)	0.340 (0.005)
Total	41,940	0.274 (0.002)	0.929 (0.001)	0.604 (0.002)	0.380 (0.002)	0.326 (0.002)
Hispanic Students						
Established Sites	2,192	0.107 (0.007)	0.887 (0.007)	0.588 (0.010)	0.161 (0.008)	0.126 (0.007)
20th Century Sites	1,875	0.116 (0.007)	0.886 (0.007)	0.562 (0.011)	0.185 (0.009)	0.137 (0.008)
21st Century Sites	491	0.133 (0.015)	0.898 (0.014)	0.627 (0.022)	0.199 (0.018)	0.146 (0.016)
Non-Site, Some Hispanic	2,512	0.203 (0.008)	0.909 (0.006)	0.585 (0.010)	0.297 (0.009)	0.242 (0.009)
Non-Site, Few Hispanic	267	0.309 (0.028)	0.820 (0.024)	0.676 (0.029)	0.456 (0.031)	0.355 (0.029)
Total	7,337	0.136 (0.004)	0.891 (0.003)	0.584 (0.006)	0.205 (0.005)]	0.160 (0.004)

N = 41,940 students

Note. Means or proportions are shown with standard errors in parentheses. Data are single-imputed. Data are weighted by the NAEP-provided comprehensive weight, *origwt.*

TABLE 2a. School Characteristics of 8th Grade Math Students in NAEP by Site

All Students	Cell Size	Total Cost-Adjusted Per-Pupil Expenditure in Dollars	Total Free & Reduced Lunch Pct.	Percent of Teacher Certified	Pct. of Math Teachers Taught More than 10 Years
Established Sites	18,180	$9,869 (20)	60.67% (0.20)	99.19% (0.00)	40.18% (0.36)
20th Century Sites	23,637	10,179 (19)	53.55 (0.18)	99.35 (0.05)	40.17 (0.32)
21st Century Sites	7,081	12,330 (48)	50.09 (0.29)	99.72 (0.06)	43.28 (0.59)
Non-Site, Some Hispanic	82,404	12,159 (13)	44.74 (0.09)	99.39 (0.03)	45.44 (0.17)
Non-Site, Few Hispanic	21,846	12,968 (28)	47.36 (0.15)	99.51 (0.00)	47.36 (0.34)
Total	153,148	11,454 (9)	50.05 (0.01)	99.39 (0.02)	43.55 (0.13)
Hispanic Students					
Established Sites	11,927	$9,981 (24)	68.35% (0.21)	99.11% (0.09)	38.18% (0.44)
20th Century Sites	9,329	9,991 (27)	64.48 (0.26)	99.10 (0.10)	35.34 (0.49)
21st Century Sites	1,697	12,776 (104)	58.77 (0.55)	99.76 (0.12)	40.97 (1.19)
Non-Site, Some Hispanic	12,142	12,577 (39)	52.36 (0.23)	99.13 (0.08)	42.89 (0.45)
Non-Site, Few Hispanic	1,306	12,987 (98)	47.90 (0.60)	99.21 (0.24)	44.96 (1.37)
Total	36,401	10,827 (18.21)	62.67 (0.13)	99.15 (0.05)	38.95 (0.26)

N = 153,148 students.

Note. Means or proportions are shown with standard errors in parentheses. Data are drawn from the CCD and weighted by the NAEP-provided comprehensive weight, *origwt.*

TABLE 2b. School Characteristics of 12th Grade Math Students in NAEP by Site

All Students	Cell Size	Total Cost-Adjusted Per-Pupil Expenditure in Dollars	Total Free & Reduced Lunch Pct.	Higher than 5% of Teachers Absent	Pct. of Non-Tenured Teachers that Stay
Established Sites	3,692	$10,074 (42)	55.72% (0.42)	18.79% (0.64)	37.48% (0.80)
20th Century Sites	5,887	10,579 (40)	48.06 (0.30)	13.00 (0.44)	35.46 (0.62)
21st Century Sites	2,268	12,654 (98)	45.60 (0.44)	17.58 (0.80)	41.99 (1.04)
Non-Site, Some Hispanic	22,602	11,978 (24)	36.90 (0.14)	11.46 (0.21)	49.24 (0.33)
Non-Site, Few Hispanic	7,491	12,870 (40)	44.93 (0.23)	5.14 (0.26)	70.66 (0.53)
Total	41,940	11,539 (17)	43.65 (0.11)	12.61 (0.16)	47.00 (0.24)
Hispanic Students					
Established Sites	2,192	$10,129 (50)	63.72% (0.48)	16.96% (0.80)	37.41% (1.03)
20th Century Sites	1,875	10,423 (65)	55.23 (0.52)	15.92 (0.85)	32.85 (1.08)
21st Century Sites	491	13,466 (234)	52.63 (0.92)	16.11 (1.66)	36.21 (2.17)
Non-Site, Some Hispanic	2,512	12,220 (85)	40.87 (0.45)	11.80 (0.64)	46.57 (1.00)
Non-Site, Few Hispanic	267	13,192 (245)	43.85 (1.23)	3.63 (1.15)	68.49 (2.85)
Total	7,337	10,887 (39)	55.61 (0.28)	15.26 (0.42)	38.90 (0.57)

N = 41,940 students

Note. Means or proportions are shown with standard errors in parentheses. Data are drawn from the CCD and weighted by the NAEP-provided comprehensive weight, *origwt.*

TABLE 3a. Site Characteristics of 8th Grade Math Students in NAEP by Site

All Students	Cell Size	Pct. of Hispanics with Bach. Deg or Higher	Pct. Unemployed in Civilian Labor Force	Pct. Poor	Pct. Spanish-Speaking, English Limited
Established Sites	18,180	13.77 (0.07)	9.59 (0.02)	17.92 (0.06)	15.96 (0.08)
20th Century Sites	23,637	15.47 (0.07)	8.25 (0.02)	14.81 (0.04)	7.91 (0.04)
21st Century Sites	7,081	16.46 (0.13)	8.01 (0.03)	12.91 (0.07)	4.97 (0.07)
Non-Site, Some Hispanic	82,404	20.01 (0.05)	7.81 (0.01)	13.28 (0.03)	2.06 (0.01)
Non-Site, Few Hispanic	21,846	21.14 (0.14)	7.74 (0.02)	15.23 (0.05)	0.43 (0.00)
Total	153,148	17.88 (0.04)	8.25 (0.01)	14.66 (0.02)	5.86 (0.02)
Hispanic Students					
Established Sites	11,927	12.04 (0.06)	10.02 (0.03)	19.57 (0.07)	18.56 (0.10)
20th Century Sites	9,329	12.90 (0.09)	8.86 (0.03)	16.79 (0.08)	10.34 (0.07)
21st Century Sites	1,697	13.95 (0.21)	8.41 (0.06)	14.13 (0.14)	7.81 (0.22)
Non-Site, Some Hispanic	12,142	17.28 (0.11)	8.38 (0.03)	14.81 (0.07)	3.62 (0.04)
Non-Site, Few Hispanic	1,306	20.80 (0.56)	7.76 (0.10)	15.49 (0.21)	0.46 (0.01)
Total	36,401	13.78 (0.05)	9.22 (0.02)	17.39 (0.04)	12.10 (0.06)

N = 153,148 students

Note*.* Means or proportions are shown with standard errors in parentheses. Data are drawn from the ACS 5-year estimates and weighted by the NAEP-provided comprehensive weight, *origwt.*

TABLE 3b. Site Characteristics of 12th Grade Math Students in NAEP by Site

All Students	Cell Size	Pct. of Hispanics with Bach. Deg or Higher	Pct. Unemployed in Civilian Labor Force	Pct. Poor	Pct. Spanish-Speaking, English Limited
Established Sites	3,692	13.76 (0.14)	9.40 (0.05)	17.30 (0.13)	16.17 (0.18)
20th Century Sites	5,887	14.23 (0.13)	8.61 (0.03)	15.60 (0.08)	7.83 (0.07)
21st Century Sites	2,268	16.36 (0.27)	7.75 (0.05)	14.15 (0.13)	4.58 (0.10)
Non-Site, Some Hispanic	22,602	19.61 (0.09)	7.50 (0.02)	12.94 (0.05)	1.95 (0.02)
Non-Site, Few Hispanic	7,491	20.75 (0.24)	7.89 (0.03)	16.74 (0.09)	0.36 (0.00)
Total	41,940	17.61 (0.07)	8.09 (0.01)	14.71 (0.04)	5.48 (0.04)
Hispanic Students					
Established Sites	2,192	12.18 (0.15)	9.86 (0.06)	19.28 (0.16)	19.33 (0.24)
20th Century Sites	1,875	12.18 (0.18)	8.94 (0.06)	17.10 (0.14)	10.17 (0.15)
21st Century Sites	491	14.28 (0.38)	8.34 (0.12)	14.79 (0.28)	7.10 (0.30)
Non-Site, Some Hispanic	2,512	17.93 (0.24)	8.24 (0.07)	14.16 (0.15)	3.20 (0.09)
Non-Site, Few Hispanic	267	20.89 (1.30)	7.65 (0.15)	16.48 (0.44)	0.35 (0.02)
Total	7,37	13.75 (0.11)	9.16 (0.03)	17.33 (0.09)	12.57 (0.13)

N = 41,940 students

Note*.* Means or proportions are shown with standard errors in parentheses. Data are drawn from the ACS 5-year estimates and weighted by the NAEP-provided comprehensive weight, *origwt.*

A means estimate of achievement in Table 4 indicates that 8th graders in 20th and 21st century sites outperform their peers in established sites. In contrast, 12th grade students in 21st century sites perform lower than their counterparts in other sites. The "21st century advantage" from earlier does not seem to apply to achievement. In fact, among 8th and 12th graders, Hispanic students in 20th century sites outperform students in other sites. Given that earlier results indicated that students, schools, and co-ethnics in 21st century sites are the most socioeconomically advantaged, followed by 20th century and established sites, this trend in achievement is surprising.[23]

TABLE 4. Mean Estimates of 8th and 12th Grade Math Achievement

	All Students		Hispanic Students	
	Cell Size	Mean (SE)	Cell Size	Mean (SE)
8th Grade Achievement				
Established Sites	18,180	277.49 (0.26)	11,927	269.62 (0.29)
20th Century Sites	23,637	284.22 (0.23)	9,329	273.14 (0.33)
21st Century Sites	7,081	283.76 (0.41)	1,697	272.11 (0.77)
Non-Sites, Some Hispanic	82,404	286.68 (0.12)	12,142	272.67 (0.31)
Non-Sites, Few Hispanic	21,846	284.22 (0.22)	1,306	271.73 (0.92)
Total	153,148		36,401	
12th Grade Achievement				
Established Sites	4,092	146.77 (0.52)	2,389	138.43 (0.61)
20th Century Sites	6,044	150.19 (0.41)	1,937	140.47 (0.64)
21st Century Sites	2,351	152.50 (0.66)	517	137.96 (1.21)
Non-Sites, Some Hispanic	24,376	155.83 (0.20)	2,744	144.72 (0.57)
Non-Sites, Few Hispanic	7,826	152.10 (0.35)	284	146.36 (2.06)
Total	44,689		7,871	

Note. Data are weighted by the NAEP-provided comprehensive weight, *origwt.*

[23] Simple hypothesis testing (See Tables A3 and A4 in Appendix) using z-tests indicates that the means of 8th grade achievement between each site are significantly different from one another. For all sub-groups, the mean of math achievement varies significantly between sites, and even between a pooled sample of students in 20th and 21st CS and their counterparts in established sites. Furthermore, tests suggest that the mean achievement of students between 20th and 21st century sites differ, which a means analysis contradicts. A conservative conclusion would be that students in 20th and 21st century perform on par with one another, while outperforming their counterparts in established sites.

The Effects of Site on Student Achievement

To evaluate this discrepancy between achievement and student, school, and site characteristics, I explore the effect of site on achievement using a series of sequential models that interact students' race-ethnic backgrounds and site of settlement while incorporating the various student-, school-, and site-level mechanisms discussed in this paper. These regressions are represented in Tables 5 and 6 for 8th and 12th graders, respectively.

8th Grade Effects

Overall, the interaction in every model contributes significantly to the overall fit per an F-test. Linear tests are used to determine whether the interactions in sites are different from one another, e.g. whether Hispanic students perform significantly differently from one another. Initially, the effect of place does not vary between sites for Hispanic students, even after accounting for individual characteristics in Model 2.

After accounting adding school characteristics, the effect of place on achievement for Hispanic students varies significantly between 20th and 21st century sites and between established and 21st century sites. In contrast, effect does not vary between established and 20th century sites. After accounting for site-level characteristics, this difference is only maintained between 20th and 21st century sites. Overall, the results suggest that there is likely an *additional* effect of place on achievement for Hispanic students that exists after accounting for school-level characteristics, but not necessarily before. These findings indicate that variation in school-level characteristics may obfuscate the effect of place on achievement for

Hispanic students between 20th and 21st century sites and between established and 21st century sites.

TABLE 5. 8th Grade Achievement Multivariate Regression Models with Interactive Effects between Site and Race-Ethnicity

	(1)	(2)	(3)	(4)	(5)
Site (Ref: Established Sites)					
20th Century Sites	3.13	2.22	2.46	2.37	2.61
	(0.27)	(0.21)	(0.48)	(0.47)	(0.48)
21st Century Sites	0.92	0.25	1.71	1.71	2.42
	(0.39)	(0.64)	(0.59)	(0.58)	(0.59)
Non-Sites, Some Hispanic	1.27	0.31	1.59	0.60	1.47
	(0.24)	(0.43)	(0.41)	(0.41)	(0.42)
Non-Sites, Few Hispanic	-4.20	-5.54	-1.53	-1.68	-0.84
	(0.34)	(0.50)	(0.47)	(0.47)	(0.49)
Race-Ethnicity (Ref: White)					
Black	-31.98	-31.10	-23.56	-18.00	-19.39
	(0.27)	(0.88)	(0.81)	(0.80)	(0.80)
Hispanic	-23.74	-25.38	-14.09	-9.46	-11.09
	(0.22)	(0.47)	(0.44)	(0.44)	(0.45)
Asian-American / Pac. Islander	10.80	11.68	11.73	12.33	12.17
	(0.39)	(0.79)	(0.73)	(0.72)	(0.72)
Amer. Indian / Alaska Native	-26.57	-38.41	-26.61	-22.59	-21.37
	(0.73)	(2.26)	(2.09)	(2.06)	(2.06)
More than one	-11.17	-8.70	-6.38	-5.38	-5.72
	(0.36)	(1.04)	(0.96)	(0.95)	(0.94)
Hispanic Interacted with Sites (Ref: Established Sites)*					
20th Century Sites		1.16	1.03	0.39	1.22
		(0.65)	(0.60)	(0.59)	(0.59)
21st Century Sites		1.98	0.15	-2.11	-1.24
		(0.92)	(0.85)	(0.84)	(0.84)
Non-Sites, Some Hispanic		2.84	-0.84	-3.10	-1.44
		(0.59)	(0.55)	(0.54)	(0.54)
Non-Sites, Few Hispanic		7.67	-0.18	-4.06	-2.23
		(1.17)	(1.08)	(1.07)	(1.07)
Individual Covariates			X	X	X
School Covariates				X	X
Site Covariates					X
Constant	294.10	295.02	266.83	279.33	281.28
	(0.24)	(0.41)	(0.48)	(0.56)	(0.60)
Tests of Interaction Significance					
F Test (Prob > F)	--	0.000	0.000	0.000	0.000
Linear Combination Tests (p>lzl)					
ES vs. 20th CS	--	0.075	0.088	0.514	0.039
20th CS vs. 21st CS	--	0.369	0.160	0.003	0.003
ES vs. 21st CS	--	0.032	0.857	0.012	0.139

N = 153,148 students

*All other race and site interactions omitted from results but are included in the regression itself.
Note. Coefficients are shown with standard errors in parentheses. Data are weighted by the NAEP-provided comprehensive weight, *origwt.* Data are single-imputed.

12th Grade Effects

The effects of site on the achievement of 12th graders vary dramatically from the results for 8th graders. For all students, there is a strong and persistent negative effect of being in new sites in comparison to established sites, particularly for 20th century sites. However, in contrast to the 8th grade regression results, the interactions of site and race-ethnicity are highly different between Established and 20th century sites; and between 20th and 21st century sites, even after accounting for individual-, school-, and student-level characteristics. These results suggest that school- and site-level characteristics do not explain the effect of place on achievement between these places. The effect of place on achievement for Hispanic students, however, is not significantly different between Established and 21st century sites and remains so even after accounting for background. Taken with the results from the 8th grade analysis, these results indicate that student-, school-, and site-level characteristics do not fully explain the differential effect of place on both 8th and 12th grade achievement between 20th and 21st century sites.

TABLE 6. 12th Grade Achievement Multivariate Regression Models with Interactive Effects between Site and Race

	(1)	(2)	(3)	(4)	(5)
Site (Ref: Established Sites)					
20th Century Sites	-0.27	-3.31	-2.10	-2.26	-1.59
	(0.50)	(0.85)	(0.78)	(0.77)	(0.78)
21st Century Sites	-1.62	-3.00	-1.48	-1.62	-0.69
	(0.73)	(1.05)	(0.96)	(0.95)	(0.97)
Non-Sites, Some Hispanic	0.85	-1.25	-0.81	-2.72	-1.66
	(0.45)	(0.73)	(0.67)	(0.67)	(0.74)
Non-Sites, Few Hispanic	-4.78***	-6.70	-3.65	-3.82	-3.74
	(0.59)	(0.83)	(0.76)	(0.76)	(0.87)
Race-Ethnicity (Ref: White)					
Black	-29.54	-26.89	-21.30	-17.44	-18.37
	(0.43)	(1.45)	(1.33)	(1.32)	(1.32)
Hispanic	-21.45	-25.40	-14.76	-9.84	-11.94
	(0.43)	(0.82)	(0.76)	(0.77)	(0.79)
Asian-American / Pac.	12.30	13.70	13.90	14.90	14.72
Islander	(0.68)	(1.29)	(1.18)	(1.17)	(1.16)
Amer. Indian / Alaska	-17.17	-28.97	-19.96	-15.47	-15.85
Native	(1.52)	(3.64)	(3.34)	(3.30)	(3.29)
Native Hawaiian / Pac. Islander	-10.21	-13.42	-4.23	-2.14	-2.55
	(2.55)	(4.31)	(3.96)	(3.90)	(3.89)
More than One	-6.70	11.24	8.78	10.85	9.98
	(1.08)	(4.79)	(4.39)	(4.33)	(4.32)
Hispanic Interacted with Sites (Ref: Established Sites)*					
20th Century Sites		6.26	5.07	3.30	4.49
		(1.16)	(1.06)	(1.05)	(1.06)
21st Century Sites		1.99	0.51	2.88	-1.18
		(1.90)	(1.74)	(1.72)	(1.72)
Non-Sites, Some Hispanic		7.87	5.34	1.87	3.90
		(1.14)	(1.04)	(1.03)	(1.05)
Non-Sites, Few Hispanic		13.88	2.45	2.95	-1.01
		(3.73)	(3.42)	(3.38)	(3.38)
Individual Covariates			X	X	X
School Covariates				X	X
Site Covariates					X
Constant	161.55	163.56	133.71	142.78	141.79
	(0.44)	(0.69)	(0.82)	(0.97)	(1.05)
Tests of Interaction Significance					
F Test (Prob > F)	--	0.000	0.000	0.000	0.000
Linear Combination Tests (p>|z|)					
ES vs. 20th CS	--	0.000	0.000	0.002	0.000
20th CS vs. 21st CS	--	0.025	0.009	0.000	0.001

ES vs. 21st CS	--	0.296	0.768	0.094	0.494

N = 41,940
*All other race and site interactions omitted from results but are included in the regression itself.
Note. Coefficients are shown with standard errors in parentheses. Data are weighted by the NAEP-provided comprehensive weight, *origwt.* Data are single-imputed.

Marginal Effects

In Table 7, I find that the 20th century advantage persists even after individual, school, and site mechanisms are accounted for. Furthermore, the minimal difference in achievement between 21st century sites and 20th century sites remains despite accounting for background characteristics. Overall, it appears that the marginal estimates across sites shift in the same direction as models progress, growing approximately eight points between Models 2 and 5. This suggests a largely consistent effect of covariates on achievement across sites.

TABLE 7. 8th Grade Student Achievement Margins of Interaction Models for Hispanic Students

	Model 1	Model 2	Model 3	Model 4	Model 5
Established Sites	269.59	269.63	275.83	279.13	277.18
	(0.28)	(0.23)	(0.22)	(0.22)	(0.27)
20th Century Sites	273.09	273.02	279.32	281.89	280.98
	(0.32)	(0.32)	(0.30)	(0.30)	(0.30)
21st Century Sites	272.39	271.87	277.39	278.73	278.26
	(0.75)	(0.63)	(0.58)	(0.57)	(0.57)
Non-Site, Some Hisp.	272.39	272.78	276.58	276.63	277.16
	(0.30)	(0.32)	(0.29)	(0.29)	(0.29)
Non-Site, Few	271.64	271.77	274.62	273.40	274.04
Hispanic	(0.88)	(1.04)	(0.96)	(0.94)	(0.94)
Site & Race Interaction		X	X	X	X
Individual Covariates			X	X	X
School Covariates				X	X
Site Covariates					X

N = 41,496 Hispanic students
Note. Achievement estimates are shown with standard errors in parentheses. Data are weighted by the NAEP-provided comprehensive weight, *origwt.* Data are single-imputed. The delta-method is used to calculate standard error in these margins estimates.

For 12th grade estimates, the 20th century site advantage increases greatly after controlling for school-level covariates. It also persists across models just as it does for 8th graders. Performance of students in 21st century, however, is already the lowest compared to other sites and continue to fall behind established sites once individual and school covariates are accounted for in Models 3 and 4. This is in contrast to 8th grade achievement, in which students in established sites perform at the lowest rates.

TABLE 8. 12th Grade Student Achievement Margins of Interaction Models for Hispanic Students

	Model 1	Model 2	Model 3	Model 4	Model 5
Established Sites	138.43	138.16	144.88	149.32	146.77
	(0.61)	(0.44)	(0.41)	(0.43)	(0.55)
20th Century Sites	140.47	141.10	147.86	150.35	149.67
	(0.64)	(0.65)	(0.60)	(0.60)	(0.61)
21st Century Sites	137.96	137.15	143.92	144.82	144.90
	(1.21)	(1.53)	(1.40)	(1.38)	(1.38)
Non-Site, Some Hisp.	144.72	144.78	149.40	148.47	149.00
	(0.57)	(0.75)	(0.69)	(0.68)	(0.68)
Non-Site, Few Hispanic	146.36 (2.06)	145.34 (3.61)	143.67 (3.31)	142.54 (3.27)	142.59 (3.26)
Site & Race Interaction		X	X	X	X
Individual Covariates			X	X	X
School Covariates				X	X
Site Covariates					X

N = 6,832 Hispanic students
Note. Achievement estimates are shown with standard errors in parentheses. Data are weighted by the NAEP-provided comprehensive weight, *origwt.* Data are single-imputed. The delta-method is used to calculate standard error in these margins estimates.

Discussion

This study sought to determine whether there was a place-specific effect on Hispanic student achievement and to what extent individual-, school-, and site-level mechanisms help explained this effect. The descriptive analysis revealed that the population, students, and schools in 21st century sites were the most advantaged compared to established and 20th century sites. In contrast, a naïve means analysis of achievement revealed that students in 20th century sites outperformed peers in 21st century sites in both 8th and 12th grade, slightly for the former and more significantly for the latter.

A regression analysis adjusting for the student, school, and site mechanisms, this difference grew, as students in 20th century sites performed the strongest in comparison to their peers in other areas in both 8th and 12th grade. Furthermore, while 8th grade students in newer sites continue to outperform their peers in established sites, 12th grade students in 21st century sites do not. Unlike for 8th graders, the results for 12th graders, are less conclusive, such that they slightly underperform compared to their peers in established sites in the naïve estimates, and more so after accounting for background characteristics.

The variation in the effect of place on achievement was assessed by using linear combination tests of the interactions between site and race-ethnicity. The results suggested that there was likely an additional effect of place on achievement between 20th and 21st century sites for Hispanic students even after accounting for school and site characteristics. Coupled with the findings that students in 20th century sites outperformed their peers, I conclude that there is an additive and positive 20^{th} century site effect that is not accounted for with the model used in this paper.

The implications of these findings are three-fold. While prior scholarship in the field has warned against the dire circumstances that may befall Hispanic students in newer areas, this paper suggests that this might not be the case. Across the board, both in the naïve estimates and after accounting for several site, school, and individual mechanisms, 8^{th} grade students in newer sites outperform students in established sites. While the results for 12^{th} grade students are less compelling, particularly after accounting for background characteristics, the cause for concern about achievement of Hispanic students in new sites may still be misplaced.

Second, studying the interaction between place and achievement requires more nuance than has been afforded to prior work as well as this study. Specifically, these results suggest that greater exploration into the trajectories of students over the course of their secondary schooling is warranted. Of course, the use of cross-sectional data of different samples of students prevents us from making claims best reserved for longitudinal data. Given the relative advantage of 21^{st} century sites, per findings in this paper, and prior work which found that 21^{st} century sites are comprised of more educated Hispanics, of lower concentrations of Hispanic students, and more integrated schools (Chunduru, 2020b), one would expect to see that student achievement in these areas exceeded those of other areas. Yet, this is not the case.

Finally, the varying patterns of achievement of students between sites may be explained by some recent case studies. These studies suggest that 20^{th} century site schools, despite being less advantaged in the traditional sense are implementing reforms and initiatives to meet the needs of Hispanic newcomers. In a study of Wisconsin, which has experienced rapid demographic change since 1990, Lowenhaupt (2010) found that schools attempted to address human capital, service delivery, and encourage social integration of new students and families. Odem (2008), in a case study of metropolitan Atlanta, found that in addition to the expansion of language programs, schools in one county have begun to establish welcome centers as well as designate certain schools to the education of newcomers. In another study of Dalton, Georgia, Edmund Hamman and colleagues chronicle many initiatives aimed at welcoming new students, particularly ones who did not yet speak English via a comprehensive set of school- and community-based programs (Hamann, 2002; Hamann et al., 2002). However, in each of these case studies, the authors find that these initiatives ultimately struggled to sustain themselves due to poor implementation, as well as a lack of funding and broader support from the community.

While this study explored how the recency of demographic change to an area might influence student achievement, there are inherently several limitations to this study. First, the use of “Hispanics” as a categorical identification of the students of interest in lieu of specific countries of origin obscures the unique migration patterns and histories of distinct groups, including specific paths to immigration and incorporation. However, in doing so, this project uses a significantly larger sample than otherwise possible, yielding much more precise estimates of achievement. Furthermore, the use of two cross-sectional samples prevents inferences about student-level factors that can explain the variation in achievement between 8th and 12th graders. For example, it is difficult to know whether the difference in relative achievement between 8th and 12th grade in 21st century sites is caused by a simultaneous selection effect in established sites in which more academically at-risk students are pushed out of schools. These types of co-occurring effects are difficult to isolate and eliminate as alternate explanations for the results of this study. Finally, the inability to determine how schools' demographics have changed over time for NAEP schools prevents inferences about how schools may be adapting to or responding to changes in their student populations. As such, I use sites as the proxy for determining the extent to which the recency of a population affects institutional responses to students. While an imprecise measure of this concept, it is enough for determining how place may shape the achievement of Hispanic students, as well as the role that school characteristics might play in this relationship.

Conclusion

Building on a unique classification of Hispanic sites of settlement in which Hispanic population growth and dispersion that occurred between 1990 and 2000 is distinguished from that which occurred after 2000, this study isolates the effects of place-specific characteristics on the achievement of Hispanic students, including the recency of Hispanic newcomers to an area. Furthermore, by using comprehensive, nationally representative data from the NAEP, ACS, and CCD, this paper offers a unique lens into how Hispanic student achievement fares across the nation by settlement site in both middle and high school.

This study sought to determine whether there was a place-specific effect on Hispanic student achievement and to what extent individual-, school-, and site-level mechanisms help explained this effect. The findings suggest that there is an effect of place on student achievement, and that this effect varies between sites, specifically between 20th and 21st century sites. Furthermore, the persistence of these differences even after accounting for mechanisms associated with schools and sites adds support the conclusion that there is a unique and additive effect of 20th century sites on student achievement, contrary to expectations given that 21st century sites are more advantaged across the board in the traditional sense. Ultimately, the proliferation of new Hispanic populations, from many countries and backgrounds to newer, less established areas throughout the country must be met with a response that school adaptation and community incorporation is necessary, but not dire; and an exploration into the different approaches used in 20th century sites vs. 21st century sites that could help explain how students in the former outperform students in the latter despite fewer traditional advantages.

Appendix

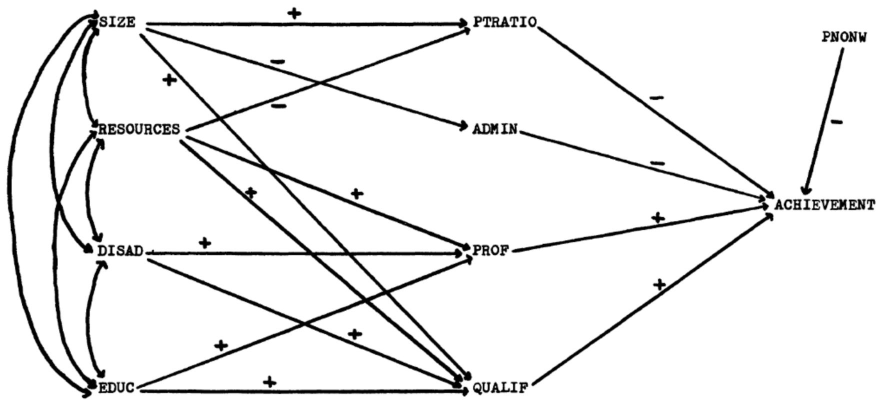

FIGURE A1.. Model of school district organization and student achievement from Bidwell and Kasarda (1975). School size (SIZE), resources (RESOURCES), the percent of disadvantaged students (DISAD), and the education level of adults in the school district (EDUC) are the primary mechanisms by which school districts affect achievement. This occurs through school-level mechanisms, such as student-teacher ratio (PTRATIO), the ratio of administrator to classroom teachers (ADMIN), the ratio of professional support staff to teachers (PROP), and the percent of teachers how hold master's degrees (QUALIF). The district racial composition measured by percent non-white (PNONW) exogenously affects achievement. Reprinted from Bidwell & Kasarda (1975).

TABLE A1. 8th Grade Achievement Variation of All Other Students

	White Students		Black Students		Asian Students		Multiracial Students	
	Cell Size	Mean (SE)	Cell Size	Mean (SE)	Cell Size	Mean (SE)	Cell Size	Mean (SE)
Established Sites	3,009	295.22 (0.58)	2,078	263.07 (0.70)	1,339	307.06 (1.00)	687	285.49 (1.16)
20th Century Sites	8,832	297.16 (0.34)	3,087	267.18 (0.57)	1,129	308.66 (1.09)	1,440	284.89 (0.91)
21st Century Sites	3,584	295.20 (0.51)	978	263.16 (0.98)	272	303.89 (2.25)	499	281.30 (1.51)
Non-Sites, Some Hisp.	45,829	295.42 (0.15)	14,337	262.74 (0.26)	4,768	305.29 (0.56)	6,172	283.26 (0.42)
Non-Sites, Few Hisp.	17,146	289.33 (0.23)	2,355	257.01 (0.61)	328	296.44 (1.86)	1,169	281.27 (0.86)
Total	78,400		22,835		7,835		9,967	

N = 153,148 students.
Note. Data is sourced from the 2013 8th grade math achievement scores from NAEP. Data are weighted by *origwt,* a combined survey weight offered by NAEP.

TABLE A2. 12th Grade Achievement Variation of All Other Students

	White Students		Black Students		Asian Students	
	Cell Size	Mean (SE)	Cell Size	Mean (SE)	Cell Size	Mean (SE)
Established Sites	1,804	162.42 (1.00)	529	133.56 (1.54)	775	175.32 (1.60)
20th Century Sites	3,375	159.82 (0.54)	1,054	132.46 (1.03)	394	169.02 (1.93)
21st Century Sites	1,384	160.00 (0.81)	261	128.93 (1.49)	115	174.44 (2.81)
Non-Sites, Some Hisp.	13,600	162.11 (0.22)	3,247	132.08 (0.47)	939	173.68 (1.02)
Non-Sites, Few Hisp.	4,145	157.26 (0.35)	732	126.56 (1.04)	73	170.39 (4.22)
Total	25,320		6,568		2,340	

N = 41,940 students.
Note. Data is sourced from the 2013 12th grade math achievement scores from NAEP. Data are weighted by *origwt,* a combined survey weight offered by NAEP. Too few multiracial students in the 12th grade sample prevent an accurate estimate across sites.

TABLE A3. Two-tailed Z- and T-tests for Average Comprehensive Math Score in 8th Grade NAEP

All Students	T-Values, Pr(ITI > ItI)		Z-Values, Pr(IZI > IzI)	
	Established Site	21st Century Site	Established Site	21st Century Site
20th Century Site	0.000	0.000	0.000	0.000
21st Century Site	0.000	---	0.000	---
20th and 21st Century Sites*	0.000	---	0.000	---
Hispanic Students				
	Established Site	21st Century Site	Established Site	21st Century Site
20th Century Site	0.000	0.981	0.000	0.445
21st Century Site	0.002	---	0.000	---
20th and 21st Century Sites*	0.000	---	0.000	---
Mexican-origin Students				
	Established Site	21st Century Site	Established Site	21st Century Site
20th Century Site	0.000	0.243	0.000	0.000
21st Century Site	0.000	---	0.000	---
20th and 21st Century Sites*	0.000	---	0.000	---

Note. Pr < 0.01 is significant at the 10% level; Pr < 0.001, is significant at the 5% level; and Pr < 0.0001 is significant at the 1% level.

*Samples for 20th and 21st CS are pooled together to compare student performance in these two areas against students in established sites.

Chapter 4

Within-School Stratification, Post-Secondary Outcomes, and Place

Abstract

Hispanic students' experiences in schools is shaped by a myriad of racialized process which are influenced by the broader place stratification of their surroundings. This study focuses on the role of within-school stratification on the post-secondary outcomes of Hispanic students. Using a nationally representative longitudinal dataset of Hispanic students, I find that areas that experienced more recent influxes of Hispanic students are the least likely to have stratified schools. Furthermore, I find a strong negative association between within-school stratification and college-going, but this effect does not vary by site. Future exploration into school-level mechanisms and their interaction with place-based effects is critical to understanding how demographic change and institutional adaptation shapes the experiences and outcomes of Hispanic students.

Introduction

The unparalleled growth of the U.S. Hispanic population after 1990 has created an acute interest in the welfare of Hispanics as well as the institutional response to such demographic change. Uniquely defining Hispanic population growth after 1990 is the dispersion of Hispanic families to newer areas across the nation, previously home to majority native-born White Americans. Considered novel arrivals to these areas, many Hispanic families in newer sites of settlement have faced both opportunity and adversity as they stake their claim in the American dream. This study uses the natural dispersion of Hispanic families to new areas to study the interaction between school stratification, place, and post-secondary educational attainment. Specifically, I study variation in Hispanic students' access to advanced math and its ultimate effect on whether they enroll in college by place.

Families settling in these new areas – "new destinations" as they are referred to in the relevant literature – include immigrants from Mexico and Central American countries as well as native-born citizens relocating from urban areas (Johnson & Lichter, 2016). Despite the diversity in the countries of origin, social, cultural, and linguistic backgrounds, Hispanic families settling in these new areas are often subject to similar social and institutional expectations in their new homes. Of the many institutions with which new families engage, public schools are often the most influential and all-consuming as most of the Hispanic population growth is spurred by families with young children and adolescents (Chunduru, 2020b). The well-being and outcomes of Hispanic students as well as the ways in which these schools respond to new students is of interest to multiple stakeholders including researchers, policy makers, and families, themselves.

Although Hispanics expect to pursue education at high levels, they remain the least educated group in the United States (Fry & Taylor, 2013). Per research by Sólorzano, Villalpando, and Oseguera (2016) the educational pipeline for Hispanic students is characterized by attrition at every level, which ultimately contributes to low levels of post-secondary completion by Hispanic students. This is the result of the combination between the skills that Hispanic students bring with them to school and the ways schools respond to students. For example, a lack of biliteracy in a child's home manifests in English deficits by primary grades. By middle school, teachers' perception of their students' abilities is shaped by their interaction with students and families, rather than the actual achievement of students. By high school, the structural deficits of schooling for Hispanic begin to take form. For example, access to advanced courses is reinforced by teachers' perceptions of their students' abilities rather than their achievement. This education pipeline manifests in what Schneider, Martinez, and Owens (2006) describe as a process of "accumulated disadvantage." This study conceives of Hispanic educational outcomes the interaction between the attributes that Hispanic students begin school with, teachers' perceptions of them, and access to opportunities in school, specifically within-school stratification.

Although expansive research regarding the ways in which schools incorporate Hispanic students via stratification, resource allocation, and services has a storied tradition in the sociology of education, the manifestation of how school structure varies by place is understudied. Sociological literature exploring the causes of educational outcomes of Hispanic students (including the role of social capital, immigrant advantage, and co-ethnic composition) has focused primarily on students in long-established Hispanic communities, due to the concentration of the Hispanic in these areas.[24] These established or traditional areas include large urban cities such as Miami, Los Angeles, and New York, which are home to ethnic enclaves, institutional support, and policies that aim to incorporate and support Hispanic students. The rapid dispersion of Hispanics to newer and less established areas across the nation compels an exploration into the effects of place and institutions on Hispanic student outcomes. By focusing on areas that lack ethnic enclaves, institutional support, and policies of more traditional areas, an opportunity to explore this association presents itself. While some scholars have warned about the impending academic crisis to take place in these newer sites of settlement, there is little evidence to suggest that this is the case, particularly as it relates to the effects of school structures on student outcomes. In fact, prior work regarding Hispanic student achievement in new areas suggests that students in newer sites either outperform or do as well as students in more traditional sites of settlement (See Chunduru, 2020b). However, little research regarding the long-term outcomes of Hispanic students in newer areas. Furthermore, the role of schools in the in the incorporation and success of Hispanic students in newer areas is also an understudied topic.

[24] See, for example Hao & Bonstead-Bruns, 1998; Portes & Hao, 2002, 2004; Stanton-Salazar, 1995, 1997, 2010; Stanton-Salazar & Dornbusch, 1995.

A quantitative exploration of how Hispanic student outcomes, school stratification, and place interact offers a lens into institutional structure and place interact to shape the outcomes of students. Because school stratification as it exists today is largely a response to desegregation efforts,[25] it is critical to interrogate how stratification manifests in places that have experienced significant demographic change.

In prior work, I delineate the importance of distinguishing between sites that were settled by U.S. Hispanics in the 1990s and the 2000s (See Chunduru, 2020b). Areas that have experienced rapid demographic change due to Hispanic migration (both domestic and international) between 2000 and 2013 are referred to as 21st century sites of settlement and areas that experienced this rapid growth between 1990 and 2000 are referred to as 20th century sites of settlement. In comparison, areas that were and continue to be sites for large Hispanic resettlement are referred to as established sites. Furthermore, I found evidence that 12th graders in newer areas either overperform or underperform in comparison to their peers in more traditional areas, suggesting that high schools, in particular, may play a uniquely stratifying role in the outcomes of Hispanic students (Chunduru, 2020a).

In this study, I extend this inquiry by considering how one school level mechanism – within-school stratification manifests in new Hispanic sites, the extent to which it affects college-going for Hispanic students, and the extent to which this effect may vary by sites of settlement. This study is positioned at the nexus of two theories that focus on the relationship between place, institutions, and stratification: racialized

[25] See, for example, Gamoran, 1987; Gamoran, Nystrand, Berends, & LePore, 1995; Sorenson, 1970.

organizational theory and place stratification theory. Employing Victor Ray's theoretical work regarding racialized organizations, I theorize that within-school stratification is a racialized organizational structure. Furthermore, building on place stratification theory, I theorize that this relationship manifests and affects students differently by place based on the relative co-ethnic status of Hispanics in the area. Using nationally representative longitudinal data, I answer the following research questions: (1) Does within-school stratification vary by site of Hispanic settlement? (2) Does within-school stratification affect the college-going rates of Hispanic students? (3) If so, does this effect vary by settlement site?

In addition, this paper is situated at the intersection of scholarship regarding within-school stratification, institutional responses to demographic change, and post-1990 population growth of Hispanics to comparatively newer areas. The combination of these theories and context offers a meso- and macro-approach to answering the research questions at the center of this study. In combination with more recent and generalizable data sources, this study offers a comprehensive analysis about the effects of within-school stratification on Hispanic students' college-going as well as the extent to which this effect varies by the recency of settlement in an area.

Theoretical Framework and Background

Within School Stratification as a Racialized System

Racial organizational theory, as advanced by Ray (2019), theorizes that organizations are racial structures that have the power to either reproduce or challenge the broader social processes of racialization. In contrast, traditional organizational theory, as posited by Weber (1978), promotes technical efficiency as the primary explanation for organizational persistence. Ray's (2019) theory challenges traditional organizational theories by extending the work of neo-institutionalists, who theorize that cultural roles and schemas support institutional persistence (Meyer, 1977; Meyer & Rowan, 1977). For example, Sewell (1992) emphasized the duality of expressing cultural schemas and marshalling resources as critical to organizational reinforcement of broader structures (as cited in Ray, 2019). Ray (2019) expounded upon this work by arguing that the combination of racial schemas imposed by organizations and the hoarding of resources formed a type of *durable* racism, in which the organization acted as both the assigner and enforcer of racialized hierarchies. Within schools, this durable racism occurs through the determination of ability based on race (racial schemas), and assignment to courses based on this perception (hoarding of resources).

Within-school stratification has long limited access to resources based on students' race and ethnic backgrounds. Beginning in the mid-19th century, a rapid expansion of compulsory public schooling included the tracking of Black and immigrant students to lower level courses. This was intended to both socialize immigrant children to become American by forcing them into public schools and to appeal to societal elites who sought to control the working class and immigrants in pursuit of economic stratification and productivity (Sadovnik & Semel, 2010). Ultimately, tracking reproduced or even increased stratification with "working-class, poor, and minority students getting the short end of the stick" (Lucas & Berends, 2002 as cited in Sadovnik & Semel, 2010, p. 4).

Throughout the mid 20th century, formal tracking was used as a counterweight to desegregation efforts. The programs assigned Black and immigrant students to mutually exclusive and highly immobile programs, or tracks, which ultimately determined their course of study throughout high school and future occupations (Cicourel & Kitsuse, 1963; Conant, 1967; Hollingshead, 1949; Rosenbaum, 1976). Operating under the guise of assigning students to tracks based on ability, school-level administrators often relied on social constructions of ability and race, rather than a standardized measure of achievement to make tracking decisions about students (Cicourel & Kitsuse, 1963; Mickelson & Heath, 1999). Supreme Court and lower court rulings in the mid-20th century, which deemed tracking and ability grouping used to bypass desegregation as unconstitutional (Mickelson, 2001, p. 216).[26]

In response to the end of formal tracking, e.g. mutually exclusive career tracks, middle- and upper-income White families resistant to desegregation efforts began to promote curricular or vertical differentiation. Where horizontal differentiation aimed to reduce variation in the curriculum and pedagogical activities associated with learning, vertical differentiation focused on organizational differentiation that aimed to reduce variation in the abilities of students. Thus, schools began to deem homogenous classroom composition as essential to maximizing student learning (Sorenson, 1970). Theoretically, these systems would allow students to take courses at various levels by

[26] Due to methodological and sampling variation, the effects of the race-ethnic composition of schools on student outcomes yields uneven and contradictory findings. However, the most compelling research indicates that desegregation benefits minority students significantly and does no harm to white students *if and only if* schools eliminate within-school stratification including tracking and ability grouping (NAACP, 1991; Wells & Crain, 1994 as cited in Mickelson, 2001).

subject, such that a student be enrolled in an advanced math course and a lower-tracked English course simultaneously. This myth was quickly dismantled by Oakes (1985/2005), who proved that the mid-20th century move towards curricular differentiation persisted along lines non-academic factors, largely race and ethnicity.[27]

Towards the latter part of the 20th century and 21st century, following realizations that curricular tracking reproduced social stratification by race and ethnicity, the movement to “detrack” schools became a focus for desegregated urban schools (Oakes & Lipton, 1992).[28] However, the co-occurring diversification of suburban schools in the 1990s and afterward led schools to make some difficult decisions. A series of qualitative studies found that White families who formerly comprised the majority of these suburban areas were predictably resistant to detracking movements (Ayscue, 2016; Diem, Welton, Frankenberg, & Holme, 2016; Evans, 2007a, 2007b; Frankenberg, Ayscue, & Tyler, 2016; Holme, Diem, & Welton, 2014; Tyler, Frankenberg, & Ayscue, 2016). Wells & Serna (1996), for example, found that elite White parents used their status and cultural capital to force schools to track students based on perceptions of merit, thereby seeking to “perpetuate their status through the intergenerational

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[27] Following Oakes’ work, a vast body of scholarship focused on how curricular differentiation essentially tracked students into secondary and occupational tracks mirroring broader racial and ethnic stratification (See, for example, Braddock & Dawkins, 1993; Garet & Delany, 1988; Hallinan, 1992; Lucas, 1999; Lucas & Gamoran, 1993; Vanfossen, Jones, & Spade, 1987; Wells & Oakes, 1996; Wells & Serna, 1996). Further, adding credence to the origins of within-school stratification as a response to desegregation efforts, race- and ethnicity-based stratification has been found to be most evident in schools with greater racial and ethnic diversity (See, for example, Lucas & Berends, 2002; Oakes, Welner, Yonezawa, & Allen, 2005; Southworth & Mickelson, 2007).
[28] Leaders of the reform movement included the National Governor’s Association, the Carnegie Corporation (see *Turning Points*) and the College Board (see *Access to Knowledge: An Agenda of our Nation’s Schools*), and the National Education Association, which vowed to eliminate tracking as it existed at the time (Oakes & Lipton, 1992).

transmission of privilege" (p. 116). Furthermore, Oakes (1992) found that the reticence to detrack was shared by school officials who sought to prevent White families from leaving either tacitly or overtly ensured curricular tracking persisted. Holme et al. (2014) noted that resistance to detracking was often complex, and overcoming it required a series of co-occurring technical, normative, and political changes. Ultimately, the effects of detracking efforts were largely mixed, with variation resulting from the optimism of school leaders to the reticence of White parents (See, for example, McDermott, Frankenberg, & Diem, 2014; Oakes et al., 2005). Tracking abolitionists warn that detracking is only effective if all students have access to the highest tracks (See, for example, Braddock & Dawkins, 1993; Wheelock, 1992) and school leadership adopts new perspectives regarding the norms and culture associated with schooling rather than a particular strategy (Oakes & Lipton, 1992).[29]

The current era of within-school stratification is largely informal. While formal systems relied on the perception of prior achievement as the primary mechanism of selection into tracks, informal systems rely upon a more decentralized combination of preferences and structures. This combination includes a mix of combination of student and parental choice (Lofton Jr., 2019; Mickelson & Everett, 2008) and existing institutional infrastructure (Mickelson & Everett, 2008; Tyson, 2011). Furthermore, in contrast to the direct teacher-based recommendations of formal tracking, subversive perceptions of student abilities based on students' race and ethnic backgrounds

[29] In contrast to tracking abolitionists, some scholars of the 20th century argued for the reformation of trac king rather than abolition citing school structure Despite the movement to abolish tracking, some scholars advocated for reforms to tracking rather its abolition (See, for example, Hallinan, 1994; Loveless, 1999).

dominate as the primary assignment mechanisms of informal tracking (Rubin, 2008; Tyson, 2011). In a recent study, Lofton (2019) found that even when decisions are left to students and families, the history of "intergenerational tracking" in African-American families contributed to lowered expectations for their own children. Thus, although the assignment process is more decentralized in informal tracking, school-leaders and teachers' perceptions of students still matter, and may do so more for students of color, just as they do for African-American students.

In addition to a more decentralized system, tracking today is more institutionally complex than ever before. For example, in a study evaluating North Carolina students' enrollment in college preparatory classes, Mickelson and Everett (2008) refer to a modern form of tracking as "neotracking," which required students to choose a curricular track, including "Career Prep, College Tech Prep, or College / University Prep Course of Study" (p. 536). These course are then nested in within-subject levels including "Regular, Advanced, Honors, Advanced Placement, and International Baccalaureate" (p. 536). These differentiated curricular tracks are then aligned to occupational pathways, which students must choose early in high school. The nested nature of neotracking led to a level of intractability and difficulty in navigating the paths.

I theorize that these modern systems of within-school stratification continue to operate as racialized systems, in particular, through assignment to advanced math courses. Furthermore, I argue that stratification is often associated with the overall racial and ethnic composition of a student body as Mickelson and Everett (2008) found. In majority-White schools, Black enrollment in the highest track was less likely than in majority-non-White schools. As Black enrollment increased, the likelihood that Black students were placed in the highest track increased (See also Southworth & Mickelson, 2007; Tyson, 2011).

Place Stratification's and Within School Stratification

The place stratification model argues that the sorting of racial and ethnic minorities in an area occurs according to the group's relative standing in society.[30] This theory, then, is premised on the importance of race and "majority-group prejudice" (Charles, 2003). For Hispanics, status is a reflection of racialized patterns and long-standing institutional barriers or enablers to incorporation as framed by Lichter et al. (2010). In addition to the race-ethnic composition of the school, I argue that the race-ethnic composition of place influences the manifestation of within-school stratification for Hispanic students through a few specific mechanisms. First, the social and legal contexts of places shapes the opportunities present to students based on their legal status, race, and ethnicity. For example, Marrow (2011) and Smith and Furuseth (2008) suggested that the institutional openness and positive intergroup relations of the 1990s were replaced with systemic shifts in policing, lower access to social services and higher education as well as an increase in the presence of immigration enforcement in the 2000s onward. These institutional barriers compound the attrition of Hispanic

[30] In contrast, the reigning theory of residential segregation scholarship throughout the 20th century was spatial assimilation theory, which asserted that individual gains in socioeconomic status contributed to higher residential status (Massey, 1985). For immigrants and ethnic minorities, this supposedly manifested in new arrivals initially locating to ethnic enclaves and later moving to majority-group neighborhoods. An interpretation of Alba & Logan (1993) by Charles (2003) notes that place stratification theory punctuates the centrality of relative racial hierarchies, such that even socially mobile individuals of minority groups are unlikely to attain residential incorporation, despite individual gains in socioeconomic status (p. 182).

students in what Sólorzano et al. (2016) conceived of as the Hispanic education pipeline. In newer sites, the enforcement of these systemic shifts might be lower and thus schools may not mirror similar forms of racialized hierarchies. Dondero and Muller (2012), for example, found that areas in which Hispanic populations are relatively new allowed greater levels of access to advanced math courses for Hispanic students compared to traditional sites.

Early literature predicted that integration of minority students in suburban schools would ensure students had access to rigorous academic instruction and English speaking peers and thus would yield an upward trajectory for Hispanic students (See, for example, Perlmann & Waldinger, 1997; Portes & Zhou, 1993). More recent findings, however, indicate that the success of integrating students in suburban schools may be function of the pace of demographic change. Frankenberg (2012) found that teachers in schools that were more “stably diverse,” e.g. maintained the racial balance of a school over time, were more likely to adapt their practices to their student body’s diversity. Similarly, Jones (2018) found that the pace of demographic change influences the availability of resources and existing race relations.

In addition to the social and legal contexts of places and the pace of demographic change, increased racial and ethnic diversity may contribute to higher levels of within-school stratification. As discussed earlier, informal stratification is a function of how school-level leaders perceive students’ abilities and post-secondary perceptions. For example, students who are limited English proficient may be inappropriately placed in special education or lower tracked courses despite their ability to navigate rigorous material due to the informal processes discussed earlier (See, for example, Klingner et al., 2005; Klingner & Harry, 2006). Frankenberg (2010) found that access to rigorous instruction became increasingly limited in diverse contexts. Suburban areas were more likely to structure integration but also less likely to provide asset-based supports for Spanish-speakers. Within-school stratification is a racialized organizational structure, which manifests and affects students differently by place based on the social and legal contexts, the pace of demographic change, and the overall racial and ethnic diversity of an area.

Method

Data

Critical policies enacted in the early 2000s such as the No Child Left Behind Act (NCLB) radically shifted school environments in various areas (See, for example, Dee & Jacob, 2011; Dee, Jacob, & Schwartz, 2013; Jennings & Rentner, 2006). I combine three recent datasets to reflect these policy and environmental changes. The High School Longitudinal Study (HSLS) is a nationally representative dataset which uses a complex sampling design. The first four waves were collected in between 2009 and 2016, in which the sampled students were in the 9th grade, 11th grade, one and three years past their scheduled high school graduation date. The HSLS data are combined with corresponding school-level files from the Common Core of Data, which included demographic, human capital, and financial resources information about all public schools in the nation. In addition, population-level information aligned to school-district boundaries from the American Community Survey's 5-year estimates between 2009 and 2013 offer demographic, social, and economic information for school districts.[31] In total, the complete data are comprised of 25,206 students, 944 public schools and 650 school districts and offers a snapshot of schools and districts in 2011, when the sampled HSLS students would have been in the 11th grade. This data, then, offers an individual-, school-, and place-based perspective about high schoolers.

The analytic sample for this project is limited to complete cases of the outcome variable and an HSLS-provided sampling weight, which is a combined weight that incorporates responses from the first round of the survey and the third round of the survey, as well as transcript weights.[32] I also limit the analytic sample to public school students in order to incorporate ACS and CCD information into this analysis, which are not available for non-public schools. I use single imputation to address missingness across the remaining. The resulting analytic sample yields 13,351 students who participated in both the first and third round of the survey. I further limit this sample to only Hispanic students in four of the five areas of interest, which constrains it to 2,050 students. I drop students from “Non-Site, Few Hispanic” areas because there are not enough Hispanic students in these areas to offer a stable estimate of within school stratification. In doing so, Non-Site, Some Hispanic areas offer a comparison to the

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[31] The American Community Survey is administered to 3.5 million households each year by the United States Census Bureau. The questions attempt to collect information across a broad range of topics including, demographic, financial, and social information. To draw generalizable inferences, three- and five-year estimates are amassed. These increase the sample size of the survey and allow for more precise estimates. This geographic data was curated from the Missouri Census Data Center and contains more information than the data provided by the U.S. Census Bureau’s EDGE division.

[32] I did not choose the combined weight that includes fourth round survey responses because each of the outcome variables in this analysis are the result of third round survey responses..

three primary sites by serving as an area that neither has strong concentrations of Hispanic students nor experienced rapid growth.

Measures

Sites

I use a site classification scheme I developed in prior work that distinguishes between areas that experienced significant growth in the school-aged population of Hispanics in the late 20th century (1990 – 2000) and in the early 21st century (2000 – 2013). Three types of sites exist. These are established sites (ES), 20th century sites (20th CS), and 21st century sites (21st CS). Furthermore, two types of "non-sites" are included to represent areas that have either *some* or *few* Hispanics but have not experienced significant growth (See Chunduru, 2020b for more information). As explained in the prior section, students from "Non-Site, Few Hispanic" areas are not included in this analysis.

Outcome

The outcome of interest for this study is *college going,* which I derive from HSLS survey information. I develop a binary measure of college-going, using 2nd and 3rd round survey information that indicates whether students have enrolled in any form of post-secondary education to develop a binary variable. Given that the focus of this study is on the pursuit of post-secondary education, rather than a particular form of such education, I use overall college-going as the outcome variable. While other outcome measures exist in HSLS, including level of college and persistence, they are not as reliable as college-going, itself, due to missingness and a lack of consistency across responses. First, the available rounds of survey data from the HSLS extend to 2016, which would mark three years after students are scheduled to graduate high school. The majority of college students are unlikely to complete college in three years. Furthermore, many students, particularly those from low-income backgrounds, are likely to experience disruption in their college careers, the effects of which are still poorly understood (Porter, 1989; Walpole, 2003). Without comprehensive longitudinal data on the pathways that students pursue over many years after high school graduation, the use of persistence, level of college, or primary institution upon college entry are not reliable. The most reliable measure of post-secondary educational attainment is overall college-going as the outcome measure.

Independent Variable

The independent variable of interest for this study is within-school stratification, which I develop using a log odds ratio. The equation is as follows:

$$\log OR = \log \left(\frac{\Pr(Y=1 \mid White\ or\ Asian)}{\Pr(Y=0 \mid White\ or\ Asian)} \Bigg/ \frac{\Pr(Y=1 \mid Hispanic)}{\Pr(Y=0 \mid Hispanic)} \right), \qquad (1)$$

where Y = the probability of being enrolled in an advanced math course by the end of high school, as defined by courses equal to or higher than Algebra 2.

This measure is based on one developed by Muller, Riegle-Crumb, Schiller, Wilkinson, and Frank (2010), who represent the race-specific probabilities of advanced math course placement. Data used to construct this index is derived from HSLS transcript information collected in the third round of data collection as well as CCD data regarding race-ethnic compositions of schools. Enrollment in Algebra 2 is designated as *advanced math* because Algebra 2 is the minimum required math course for college-enrollment across most four-year public and private institutions (Kim, Kim, DesJardins, & McCall, 2016; Rech & Harrington, 1982). I combine White and Asian students (the latter of which excludes Native Hawaiian Pacific Islander Asian-Americans) for two reasons: (1) the size of the Asian-American populations in most high schools is relatively very small; (2) the parallel patterning of course-taking, post-secondary enrollment, and residential segregation by White and Asian students is largely similar in this sample.

In this measure, I do not capture the probability of advanced math course enrollment for other race-ethnic groups. Those excluded are American Indians and Native Hawaiian Pacific Islanders given their significantly small proportions, and non-parallel patterning of course-taking, post-secondary enrollment, and residential segregation compared to larger Asian-American groups such as Chinese students. As a reference, I also construct analogous measures for Whites or Asians compared with Black students.

When the value of this measure is exactly zero, it indicates that the probability of being in advanced math given a student is Hispanic is equal to the probability of being in advanced math given a student is White or Asian in the high school. For positive values, the higher the value, the greater the Hispanic underrepresentation in advanced math, e.g. the higher the level of within-school stratification. When the value is negative, the closer the value is to zero, the more likely schools are to be *stratified*. A negative value indicates that the overall odds ratio is lower than one, that is the numerator is smaller than the denominator.

Covariates

Covariates for this analysis include individual-, school-, and district-level variables that are a part of the adjusted set, per the conceptual model in Figure 1 below. Individual-level variables include *parent education*, a binary measure of whether the student's parent has a college degree, derived from the HSLS parent survey. The *family's socioeconomic status* is measured using a composite variable developed by Stephen L. Morgan using HSLS composite variables. The final individual-level variable is binary indicator of whether a student's *parent has difficulty communicating with the school due to a language barrier*, which I code using first round parent survey information from the HSLS.

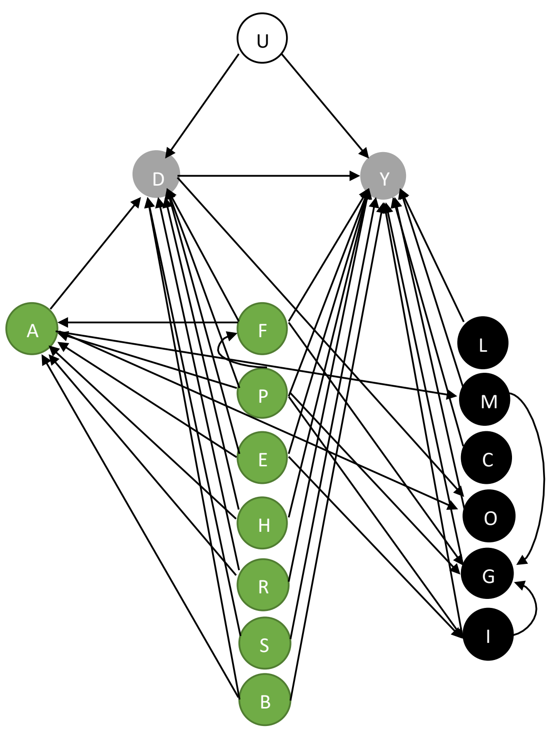
School-level variables include the *school's co-ethnic composition,* drawn from the CCD or HSLS first round administrator survey information when CCD information is not available. Furthermore, I include a *school-level composite of socioeconomic status*, that aggregates individual socioeconomic status.[33] I also use *cost-adjusted total per-pupil expenditures*, which I developed by manipulating a CCD provided expenditures to incorporate urbanicity and cost of living data from the Bureau of Labor Statistics. Finally, I include a log odds ratio of the school's Hispanic stratification from 9th grade Algebra 1, e.g. students who either took Algebra in 8th or 9th grade are considered to be on-track to

33 This presumes that the sample for each school is representative of the school, which is appropriate given that students are selected using a simple random sample in the HSLS.

advanced math. One district-level variable is included in the adjustment set – the percent of *Hispanic or Latino population with a bachelor's degree* in the school district – which I derived from the ACS 5-year estimates from 2009-2013.

Analytic Strategy

To review, the research questions for this project are as follow: (1) Does within-school stratification vary by site of Hispanic settlement? (2) Does within-school stratification affect the college-going rates of Hispanic students? (3) If so, does this effect vary by settlement site? To represent the theorized relationship between within-school stratification as a racialized organization and place, I develop a conceptual model in the form of a directed acyclic graph (DAG), represented in Figure 1 below.



Legend

○	Unobserved variables
● (green)	Adjustment set
● (black)	Non-adjustment set
● (grey)	Treatment & outcome variables
→	Causal path
Adjusted Set	
Y	College-going / Level of college / Persistence in college / Graduates high school
A	Within-school stratification of Hispanic students, Algebra 1
D	Within-school stratification of Hispanic students, advanced math
H	Co-ethnic composition of school
P	Parent education
F	Family income & occupational prestige post-migration
E	English language ability of parents
R	School resources and funding
S	School SES
U	Unobserved factors that confound relationship (unobserved)
B	Co-ethnic education level of SD
Unadjusted Set	
I	Family income & occupational prestige pre-migration
O	College-going rate of high school
M	Whether student took advanced math
L	Whether student took Algebra 9 in or before 9th grade
C	Whether student plans to go to college
G	GPA

FIGURE 1. Conceptual Causal Model for College-Going *without* Destination, Country of Origin, or Labor Market

All of the variables in this model are observed except for *U,* which is a proxy for several unobserved factors, including systemic inequality, residential choices limited by discriminatory practices, district-level policies, etc. I do not presume to account for these unobserved factors,. Therefore, I estimate an association rather than a causal estimate. The adjustment set, or the covariates which I include in the analytic model are determined by blocking the back-door paths between the primary independent variable and outcome variable, represented by D and Y, respectively (See S. L. Morgan & Winship, 2015 for an excellent treatment on causal estiamation). Backdoor paths include confounder variables, which are represented in green, and require adjustment. The variable, *A,* serves as a latent adjustment variable, as it represents within-school stratification in the 9th grade, e.g. placement in Algebra 1. As such, all of the confounders that cause both *D* and *Y* also cause *A*. While adjusting for *A* might actually remove some of the true effect of D on Y, we must do so given that it causes *M* and *O,* which are whether a student takes advanced math by the end of high school and the overall college-going rate of the high school itself. In this sense, I attempt to account for the temporal order of these relationships. The variable *A* is a 9th grade level factor that influences two 12th grade level factors. Without adjusting for this relationship, we risk the over inflation of the effect of within-school stratification on college-going..

To answer the first research question (1) Does within-school stratification vary by site of Hispanic settlement?). I use descriptive means-testing to determine the extent of within-school stratification by settlement site. For the second research question, I conduct a series of logistic and multinomial logistic regressions to determine the effect of within-school stratification on college-going. To determine whether this effect varies by settlement site, e.g. the third research question, I incorporate interactions into the logistic and multinomial logistic regressions between place and within-school stratification. The complete logistic model used in this analysis is as follows:

$$ln\frac{Pr(Y_i = 1)}{1 - Pr(Y_i = 1)} = \beta_0 + \beta_1(WSSxSite)_i + X\beta + e_i \quad (1)$$

where $Pr(Y_i = 1)$ represents probability of college-going. The key interaction of interest is one between within-school stratification (WSS), which is a continuous variable and the site of settlement, which is a categorical variable. The vector, X, represents the student-, school-, and district-level covariates of this study.

Results

Descriptive Analysis

Some key descriptive insights in Table 1 shape our understanding of how within-school stratification and college-going are related. Students in newer sites are less advantaged than students in established sites, a finding supported by prior research. Parrado and Kandel (2008b), for example, found that the low-wage, low-skill employment opportunities that contributed to the rise of new sites also attracted immigrants who were more likely to be from lower socioeconomic backgrounds in new areas in comparison to established areas (See also Johnson & Lichter, 2016; Lichter, Sanders, et al., 2015).

However, in contrast to predictions about students in these new sites as well as what might be expected given their overall socioeconomic status, these descriptive findings reveal that college-going is highest for students in 21st century sites. One potential reason for this may lie in the role of school-level mechanisms, particularly within-school stratification. I find that schools in 21st century sites are the *least* stratified, followed by 20th century sites and then established sites. This trend supports a strand of inquiry regarding the role of within-school stratification on college-going.

TABLE 1. Descriptive Statistics of Analytic Sample by Site

	Established Sites	20th Century Sites	21st Century Sites	Non-Site, Some Hispanic
College-going	69.58 (1.93)	60.54 (2.01)	78.03 (3.67)	62.85 (1.75)
Within-School Stratification	1.30 (0.08)	0.79 (0.09)	0.37 (0.16)	-0.31 (0.08)
Covariates				
Percent of School that is Hispanic	62.74 (0.98)	46.83 (0.89)	25.20 (0.84)	14.45 (0.40)
Parent attended college	30.07 (1.93)	29.30 (1.87)	21.80 (3.68)	35.31 (1.73)
Family SEI	50.01 (0.75)	47.89 (0.71)	45.49 (1.48)	51.06 (0.68)
Parent has difficulty speaking English	21.93 (1.73)	26.06 (1.81)	33.59 (4.21)	15.95 (1.33)
School-level mean SEI	22.69 (0.57)	22.77 (0.55)	16.59 (0.82)	23.35 (0.51)
Pct. White in School	19.55 (0.84)	32.60 (0.94)	41.52 (2.17)	58.58 (0.91)
Pct. Black in School	6.57 (0.38)	14.37 (0.55)	23.01 (1.69)	19.54 (0.75)
Pct. Hispanic in School	62.74 (0.98)	46.83 (0.89)	25.20 (0.84)	14.51 (0.40)
Per-pupil total exp.	$15,874 (1,816)	$22,238 (2,776)	$15,081 (410)	$12,195 (161)
Pct. of Hispanic pop. with a bachelor's degree	12.40 (0.37)	12.73 (0.46)	11.47 (0.65)	15.43 (0.37)
Other Variables				
Number of Hispanic Students per School	4.97 (0.16)	3.94 (0.12)	2.63 (0.16)	2.35 (0.06)
Percent of School that is Black	6.57 (0.38)	14.36 (0.55)	23.01 (1.69)	19.55 (0.75)
Within-School Stratification for Black Students	-1.15 (0.08)	-1.05 (0.11)	-0.38 (0.27)	-1.68 (0.10)
Level of College*+				
4-year	24.51 (1.80)	28.07 (1.86)	39.89 (4.36)	31.67 (1.69)
2-year	40.21 (2.06)	28.02 (1.86)	36.24 (4.28)	27.91 (2.63)
Persisted in College+				
Left college	23.78 (1.78)	22.65 (1.72)	46.08 (4.42)	28.34 (1.64)
In college	45.79 (2.09)	37.89 (2.00)	31.94 (4.14)	34.51 (1.73)
Graduated High School	86.95 (1.41)	85.26 (1.46)	92.80 (2.29)	93.67 (0.88)
GPA	2.35 (0.03)	2.32 (0.03)	2.59 (0.06)	2.46 (2.97)

N = 2,050 Hispanic Students.

Note. Means or percentages are shown, with standard errors in parentheses, unless otherwise noted. Data are weighted by combined analytic and response HSLS weight, *w3w1stutr.*

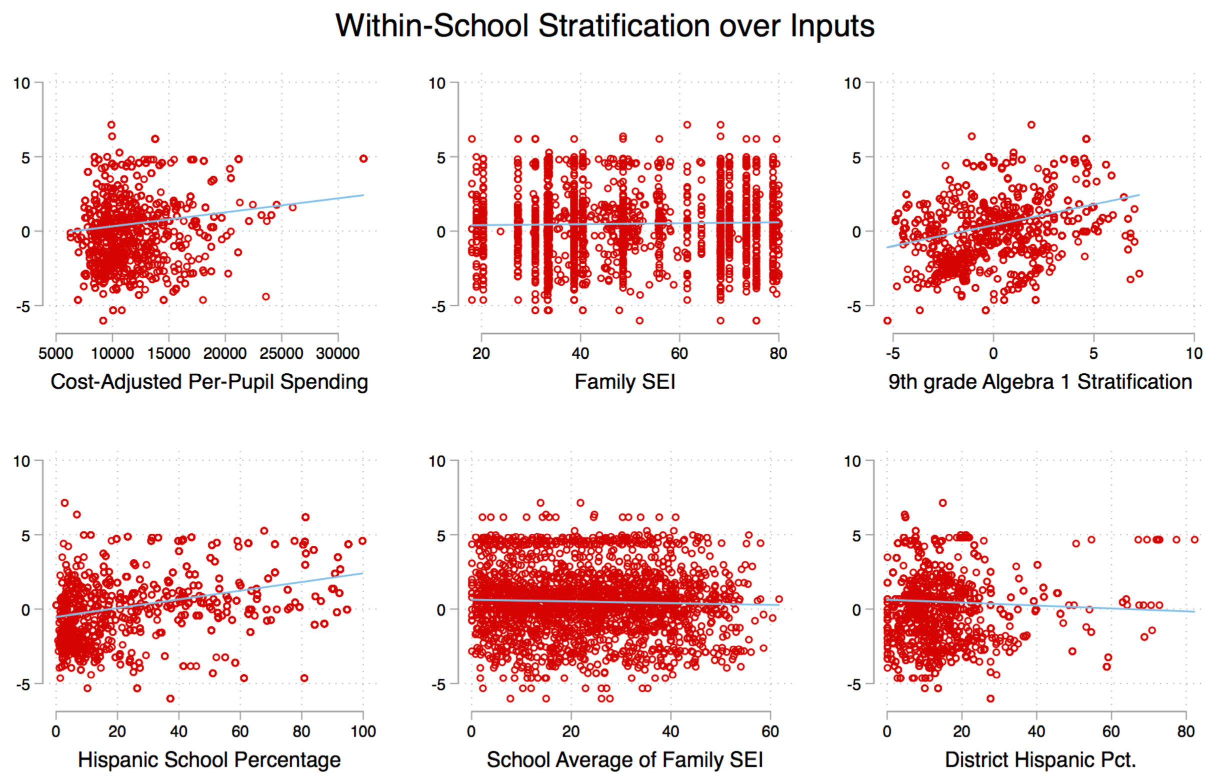
*Percentages of students in the sample that are in each category do not add up to 100, because remaining percent either did not respond to this question.

+Sample sizes for these variables vary from the analytic sample because these variables are not included in the final model. Therefore, they were not incorporated into the single imputation technique used to account for missingness. They are only included for reference in descriptive statistics.

Variation of Within-School Stratification by Site

Within-school stratification, the school mechanism of interest in this study, is measured using a derivation of individual student data regarding course enrollment. As described earlier, the extent to which the percentage of Hispanic students in a school in advanced math (e.g. math courses equal to or higher than Algebra 2) is representative of the overall population determines the value of the log odds ratio. Past research has found associations between higher levels of within-school stratification in schools that are more racially and socioeconomically diverse (See, for example, Lucas & Berends, 2002; Oakes et al., 2005; Southworth & Mickelson, 2007). These results hold in these findings which indicate higher levels of WSS in established sites, which are also more racially and socioeconomically diverse.

One concern about the use of mean WSS as a measure of stratification by site is the potential uneven distribution of the measure. WSS is bipolarly distributed across sites with the majority of schools either close to non-stratification or to the highest level of stratification. Nonetheless, WSS is normally distributed around the value of zero. Given that all three sites experience spikes in high levels of stratification, it is unlikely that one site is unduly biased by its bipolar distribution, when sites are compared with one another.



Note. For per-pupil spending, values above $50,000 excluded. Y-axes are shown in within-school stratification.

FIGURE 2. Associations between within-school stratification over inputs.

Another potential concern about the use of an aggregated measure to determine school-level information is that the HSLS sample is not representative of the student body of each school. Approximately 30 students are sampled from each school, which includes between three and five Hispanic students per school, on average, as demonstrated in Table 1. With such small samples of Hispanic students, sampling bias may contribute to measurement bias of the WSS measure To address these concerns, I explore the association between WSS and other individual and within-school measures. If reliability is not a concern, we would expect to see expected associations between various school-level inputs and WSS. Thus, in Figure 2, I plot WSS against various school-level inputs. Of these, school average of family SEI is aggregated using student-level data. Slight positive associations exist between within-school stratification cost-adjusted per-pupil spending, 9th grade stratification, and Hispanic student percentages. As the Hispanic student percentage per-pupil spending increases, we would expect to see higher levels of within-school stratification given the propensity for racialization as the concentration of minority groups increases. No association exists between WSS and family SEI, or school average of family SEI.

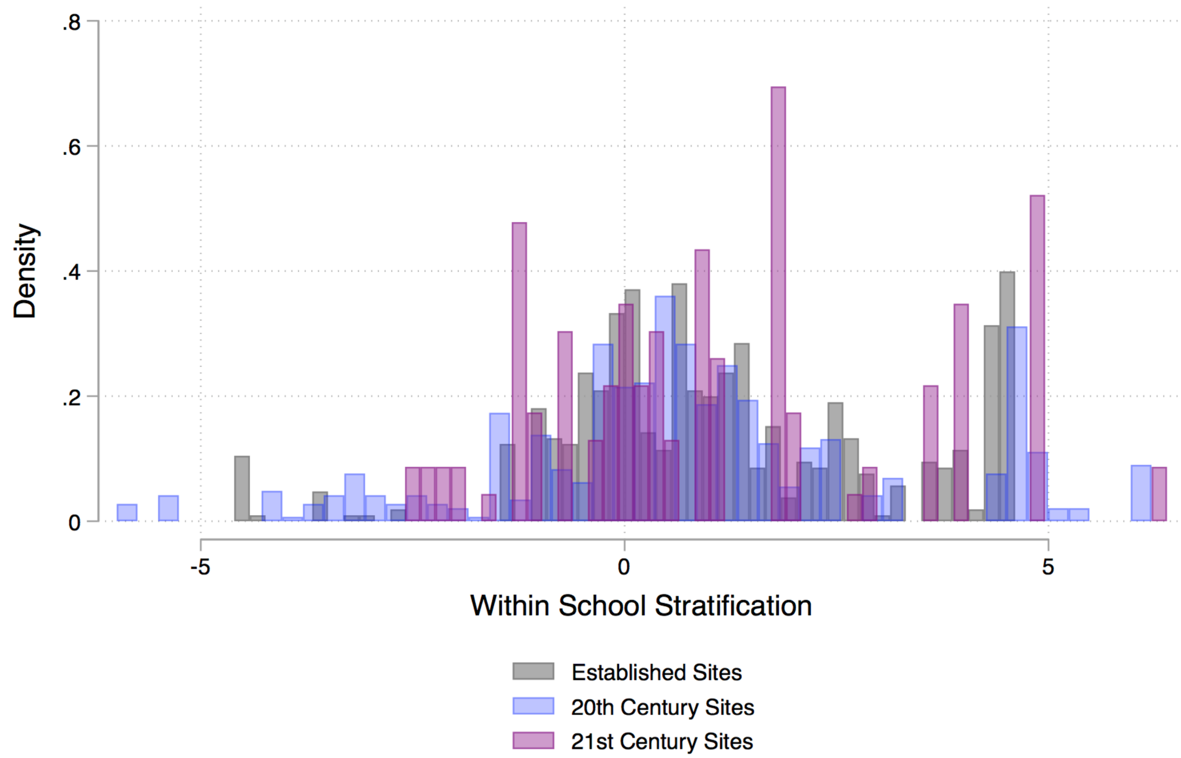


FIGURE 3. Histogram of within-school stratification for Hispanic students by site.

Effect of Within-School Stratification on Outcomes by Site

Aligned to the analytic strategy described earlier, I test three models. The first tests only the interaction of within-school stratification and site on college-going to determine whether there is an effect and the extent to which this effect varies by site, irrespective of all other characteristics. The second model tests this interaction after accounting for individual-level characteristics. The final model incorporates school- and district-level characteristics. These models, in sum, answer the remaining two research questions: Does within-school stratification affect the college-going rates of Hispanic students? If so, does this effect vary by settlement site?

TABLE 2. Effect of Within-School Stratification on College-Going

	Model 1	Model 2	Model 3
Within-school stratification (WSS)	-0.180*	-0.183*	-0.143
	(0.075)	(0.075)	(0.075)
Site (Ref: Established Site)			
20th Century Sites	-0.625*	-0.615*	-0.680**
	(0.243)	(0.240)	(0.250)
21st Century Sites	0.193	0.307	0.307
	(0.608)	(0.648)	(0.721)
Non-Site, Some Hispanic	-0.582**	-0.658***	-0.814**
	(0.184)	(0.184)	(0.273)
Interactions between WSS & Site (Ref: Established Site)			
20th CS x WSS	0.140	0.130	0.125
	(0.100)	(0.099)	(0.102)
21st CS x WSS	0.152	0.088	0.113
	(0.208)	(0.211)	(0.213)
Non-Site, Some Hispanic	0.093	0.091	0.079
	(0.088)	(0.089)	(0.090)
Student-Level Variables			
Parent attended college		1.057***	0.975***
		(0.168)	(0.174)
Family SEI		0.008	0.007
		(0.005)	(0.005)
Parent has difficulty speaking English		0.146	0.194
		(0.146)	(0.146)
School-Level Variables			
Within-school stratification, 9th grade			-0.065*
			(0.029)
School's Hispanic Percentage			0.000
			(0.005)
Per-pupil cost-adjusted total expenditures			-0.000**
			(0.000)
School-level mean SEI			0.004
			(0.005)
District-Level Variables			
Pct. of Hispanic / Latino pop. with a Bach.			0.028**
Degree			(0.010)
Constant	1.085***	0.400	0.157
	(0.142)	(0.278)	(0.467)

N = 2,050 *** p<0.001, ** p<0.01, * p<0.05
Note. Coefficients are shown, with robust standard errors in parentheses, unless otherwise noted.

The overall effect of WSS on college-going is still significant once individual background characteristics are accounted for and it hardly loses significance with the inclusion of school- and district-level characteristics ($p = 0.057$ in Table 2). When disaggregated by site in Table 3, the marginal effect of WSS is only significant in established sites, even after accounting for student-, school-, and site-level covariates. In newer sites, this effect is largely insignificant. While tempting to conclude that the effect of WSS is only relevant in established sites, it is likely that the large sample size of established sites contributes to the overall significance of the effect. A closer inspection in Table 3 reveals that the effect of WSS on college-going in newer sites is obfuscated by individual-level characteristics and is a function of school and district characteristics. That is, the inclusion of individual-level mechanisms in Model 2 yields a much stronger marginal effect of WSS for 21st CS and 20th CS. However, once school- and district-level variables are included, this effect dissipates.

In addition to the main effects of within-school stratification on college-going, the generational and co-ethnic education effects in Table 2 indicate the persistent effect of the transmission of educational advantage through family and networks. While some of the effects can be attributed to the school-level structure of stratification, the strength of effect of parental education, in particular, supports the existing narratives regarding individual background. In addition, the significance of the effect of co-ethnic education levels suggests that the effects of co-ethnic status on college-going are independent of the relationship between within-school stratification and college-going. Other school-level structures that are meaningful include cost-adjusted per-pupil expenditures and 9th grade within-school stratification. The inclusion of 9th grade WSS serves as a mechanism to isolate the effect of advanced math stratification, solely. It also accounts for schools that may reverse the trend of stratification over the course of a student's high school career.

TABLE 3. Marginal Effect Percentages of WSS on College-Going by Site

	Model 1	Model 2	Model 3
Established Sites	-3.56*	-3.58*	-3.00*
	(1.42)	(1.39)	(1.40)
20th Century Sites	-0.94	-1.31	-0.81
	(1.58)	(1.40)	(1.54)
21st Century Sites	-0.48	-1.61	-0.74
	(3.25)	(2.81)	(2.88)
Non-Site, Some Hispanic	-2.05	-2.20	-1.86
	(1.11)	(1.05)	(1.05)
Site & stratification interaction	X	X	X
Student-level covariates		X	X
School-level covariates			X
Site-level covariates			X

N = 2,050 *** p<0.001, ** p<0.01, * p<0.05
Note. Marginal effect percentages are shown with standard errors in parentheses. The estimates represent the change in the percent of college-going from one unit increase in WSS by site.

An even more disaggregated exploration into the composition of the probability of college-going over levels of WSS is displayed in Figure 4. The results reveals a consistently inverse relationship between college-going and within-school stratification such that the probability of college-going declines as within-school stratification increases in all of the models. This relationship is consistent across models, and slightly strengthens for 21st century sites in model 2 in particular. As such, WSS is associated with college-going across sites. For established sites, this effect persists with the inclusion of individual-, school-, and site-level characteristics, which do not change the marginal effect. For newer sites, small sample sizes contribute to insignificance of the effect.

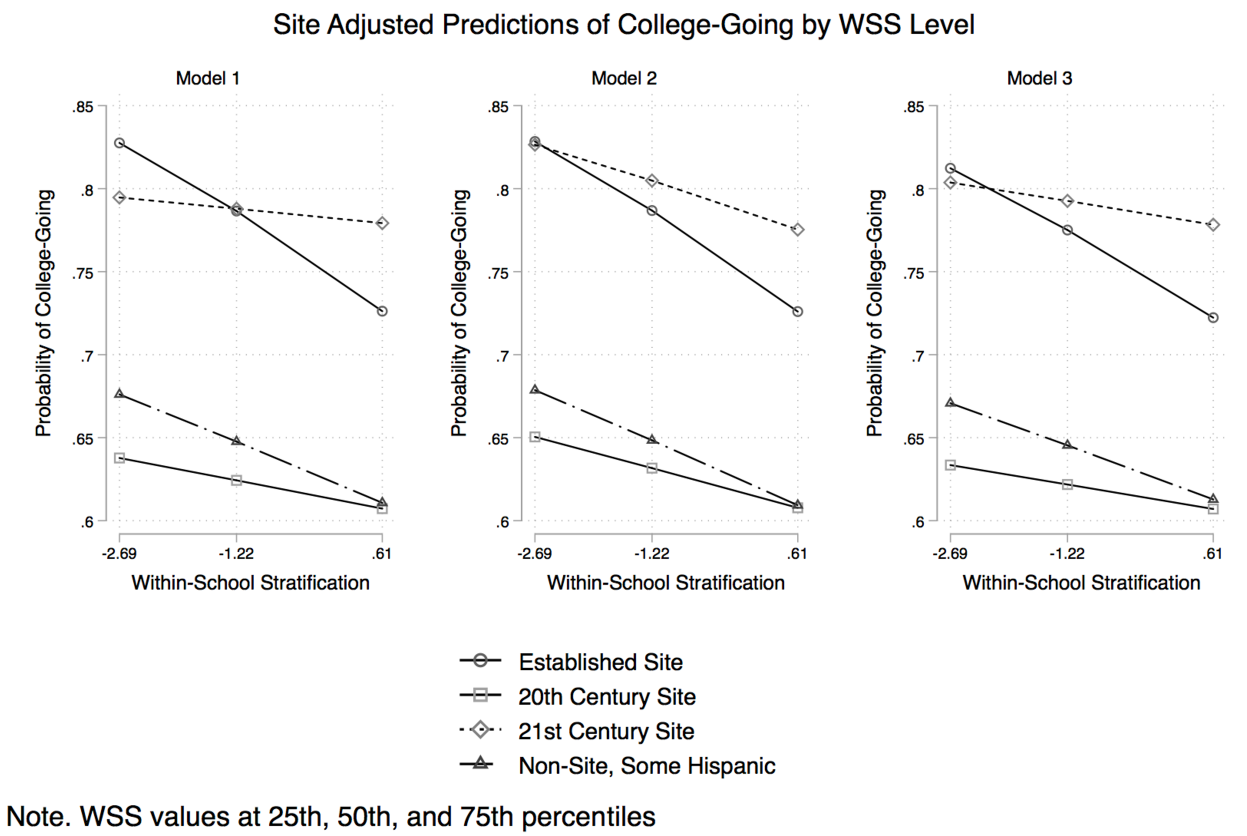


FIGURE 4. Average adjusted predictions of college-going by site, over levels of within-school stratification. Results extracted from models in Table 4.

Discussion

Using Ray's (2019) racial organizational theory and place stratification theory, this study theorized that within-school stratification is a form of racial stratification which varies by place. I aimed to illustrate how schools' implementation of racial stratification systems are forms of racial organization. Furthermore, I use place stratification theory to conceptualize the stratification of Hispanic students by place. Thus, I hypothesized that in areas with lower levels of Hispanics, slower demographic change, we would expect to see lower levels of within-school stratification. The association between recency of site and the magnitude of within-school stratification bears out such that schools in newer sites are less stratified than in established sites. Although early literature indicated that minority students in suburban schools would experience an upward trajectory, more recent work by Frankenberg (2010) and others suggested the opposite, that suburban areas did not provide access to rigorous instruction. The findings from this study support the work of scholars who found higher levels of within-school stratification in schools which were more racially and socioeconomically diverse (See, for example, Lucas & Berends, 2002; Oakes et al., 2005; Southworth & Mickelson, 2007).

As the concentration and presence of Hispanic students increases, so too does the extent of within school stratification, per the results discussed earlier. This difference in stratification may be the result of the continued role of adult decision-makers whose biases about students stem from group status rather than individual ability. Furthermore, the novelty of Hispanic students and the resulting preconceived notions in newer sites may yield administrators and teachers to be less biased in determining course assignments. In contrast, teachers and administrators in established sites may have entrenched negative preconceived notions about Hispanic students which may shape assignment to courses. Furthermore, the positive association between Hispanic student percentages and within-school stratification suggest some support for the idea that stratification is more prevalent in more racially diverse schools. However, areas with faster paces of demographic change, e.g. newer sites, do not appear to be positively associated with within-school stratification. It is possible that the overall composition of a school coupled with the pace of demographic change is more predictive of the extent of within-school stratification.

There are clear differences in how within-school stratification manifests between sites, which translate to its effect on college-going. Overall within-school stratification is consistently negatively associated with college-going, with the most significant association occurring in established sites. A deeper exploration into the relationship in newer sites revealed that the predicted values in the complete model essentially bifurcated into high and low probabilities of college-going, which could explain an overall lack of association (see Table A2 in Appendix). Yet, college-going and within-school stratification do not map onto one another perfectly by site. While within-school stratification is highest in established sites, college-going is lowest in 20th century sites. However, students in 21st century sites demonstrate the highest likelihood of going to college and are least likely to be in stratified schools.

The effect's variation by site is a function of protective mechanisms that are associated with the longevity and institutional presence of Hispanics in different sites. For example, students in established sites have outsized levels of college-going, despite higher levels of within-school stratification. In fact, they are also more likely to graduate from high school, go to four-year college, and are the most likely to persist in college compared to students in newer areas (see Table 1). Yet, high schools in established sites are more likely to be stratified than in newer sites. Furthermore, the negative relationship between increased within-school stratification and college-going is significant in established sites, such that as within-school stratification increases, the likelihood of college-going declines. Thus, the relationship between stratification and college-going in established sites is relatively expected. The heightened level of stratification in established sites offers support to the theory that co-ethnic status may contribute to the racialized organization of schooling. That is, sites that have lower co-ethnic educational levels are likely to experience higher levels of within-school stratification. However, the protective effects of institutional supports, co-ethnic networks, and services offered in larger more established areas may counteract the potential negative effects of within-school stratification. Therefore, students in established sites who may otherwise experience the adverse effects of within-school stratification are protected via mechanisms associated with co-ethnic density and institutional supports.

The implications of these findings are three-fold. I theorized that within-school stratification was a racialized organizational structure that manifested and affected students differently by place, based on the relative co-ethnic status of Hispanics, overall racial composition, pace of demographic change, and the social and legal contexts of an area. If this were the case, we should expect to see variation in the extent of within-school stratification by place as well as variation in its interactions with sites to be significantly different from one another. While the former bore out in the initial analysis of the extent of within-school stratification, the latter did not. The only significant marginal effect of stratification exists in established sites. Overall, these findings failed to provide meaningful support for the supposition that place stratification theory applies to the effects of within-school stratification. However, there is reasonable support to suggest that the extent of within-school stratification is associated with the recency of site, such that sites with newer populations of Hispanic students are less likely to be stratified.

Furthermore, I theorized that social standing relative to other groups as measured by co-ethnic educational status informs the extent of within-school stratification, such that schools stratify students by the relative status of Hispanics in the broader area, which is shaped by the recency of migration, and background. Evidence for this exists by the fact that established sites have higher levels of within-school stratification compared to newer sites. However, there is no discernable difference in the level of stratification between 20th and 21st century sites. In concert with the notion that within-school stratification is a response to changes in the internal population structure of a school, these findings indicate that areas in which schools' demographics are still majority-White, Hispanic, students are less likely to be stratified. Furthermore, there is no evidence that the novelty of Hispanic students in the newest sites, 21st century sites, contributes to lower levels of stratification in comparison to 20th century sites, where Hispanic students have been present for at least three decades.

Secondary findings that pique one's curiosity include the variation in long-term outcomes as well as stratification, itself by site. Students in 21st century sites, for example, are significantly more likely to enroll in college than in other sites and are the least likely to persist in college, while students in established sites are the most likely to do so. This result may likely be a function of the types of colleges that students in new sites have access to and pursue in comparison to students in established sites. For example, students in 21st century sites are much more likely to attend two-year colleges than four-year colleges, whereas students in established and 20th century sites show no preference between the two. Research regarding Hispanic college persistence suggests that community colleges and two-year programs are the greatest contributor to college degree attainment among Hispanic youth (See summary of research in Rendon & Amaury, 1989).

Limitations and Sensitivity Analyses

The small sample size of Hispanic students in the data likely contributes to some unhelpful variation in the data itself. However, the most pernicious limitation of this study is measurement bias introduced by potential sampling error. The use of a school-level variable constructed using student-level data as the primary independent variable can contribute to systemic error that is modeled off sampling error. If students are not sampled randomly at the school-level, there is an increased likelihood of systemic error which can contribute to bias at two levels: the student level and the school level. Students in the HSLS are *theoretically* randomly sampled within schools. However, with sample sizes of approximately 30 students per school, sampling error is highly likely. There is little evidence that the HSLS systematically undersamples Hispanic students in advanced courses. A more likely scenario is one in which schools undersample Hispanic students, overall. As a result, it is possible that the WSS measure is not a reliable estimate of the level of stratification in the school, given that it extrapolates advanced course placement for all Hispanic students in a school from the few sampled in the HSLS. Earlier I discuss the results of an associational analysis between various school-level inputs and WSS to study the reliability of the WSS measure. I find that there are no meaningful associations between WSS and school-level inputs, which suggests that WSS is not endogenously related to school inputs and is a relatively reliable measure. To further explore the potential issues associated with the WSS measure, particularly those that may arise from undersampling Hispanic students, I conducted three sensitivity analyses.

In the first sensitivity analysis, I limit the sample to include schools with at least three Hispanic students. In doing so, approximately half of the Hispanic student sample is lost. However, the results in Table A5 in the Appendix revealed minimal differences in the overall results compared to Table 2's regression analysis using all 2,050 Hispanic students in the study sample. While the magnitudes of the marginal effects are slightly different (see Table A6) compared to Table 3, the significance of the findings for the three primary sites remains similar. In non-sites with some Hispanics (NSSH) the marginal effect are significant in Models 1 and 2, which they are not in Table 3. Given that this study's primary concern is with the three types of sites, this difference does not significantly alter the findings.

In a second sensitivity analysis in Tables A7 and A8, I eliminate observations in the top and bottom 5th percentiles of WSS. In doing so, I drop schools with extremely high levels of WSS (e.g. schools with high positive values) and extremely low levels of WSS (e.g. schools with high negative values). These tail values may be the result of unbalanced ratios. For example, a school with very few White or Asian students in advanced math and many Hispanic students would in advanced math would yield a highly negative log odds ratio. This type of school is not necessarily less stratified than other schools, but suffers from an imbalance between demographic groups that prevents and accurate perception of stratification. In contrast, a school with many White and Asian students who are mostly enrolled in advanced math and one Hispanic student, who happens to not be in advanced math would appear to be highly stratified, which is misleading. The resulting analysis consists of 1,813 Hispanic students in the sample and findings that mirror the study's results. In fact, once this robustness test is conducted, the findings indicate a stronger WSS effect on students than previously found. Furthermore, the increase in the magnitude of the marginal effects of WSS on college-going (see Table A8) suggest that the study's analysis was not upwardly biased by including schools within the tails of the WSS measure.

In the final sensitivity analysis, I exclude schools with samples that are majority Hispanic minority White or Asian students, e.g. schools with within-stratification values of less than zero. The comparison between schools, then, is limited to ones in which Hispanic students are the minority. In this analysis, the overall significance of the results once again remains consistent. However, the magnitudes and direction of the effects shift significantly, such that within-school stratification negatively affects college enrollment in established sites, but has a positive effect on college enrollment in newer sites. Because the cell sizes of newer areas drop significantly due to the reduction of the overall sample, I avoid making significant inferences from these results. Ultimately, the overall effects of each of these sensitivity analyses reveals similar findings to those of the primary model in this study, I operate with a level of cautious confidence regarding the use of a within-school stratification measure that aggregates individual level data.

In addition to concerns about the WSS measure, other measurement issues are also worth considering. In particular, the use of the Hispanic subgroup occludes meaningful information about immigrant generation and country of origin effects. These effects include social, cultural, and economic processes that contribute to how families enter and settle in the United States, particularly as it relates to new areas across the country. I use Hispanic rather than immigrant generation and country of origin information to ensure appropriate cell sizes in each area. Given the small Hispanic sample in the HSLS, further subgrouping of students would likely yield this analysis impossible. Furthermore, considering students by the Hispanic subgroup allows for the use of the school district geocoded ACS data. While standard ACS data does contain this information, it is not available in the 2009-2013 5-year estimates, which are geocoded to school district boundaries.

Conclusion

This study sought to contribute to educational literature associated with new sites of Hispanic settlement by exploring the role of a school-level mechanism in explaining place-based effects. It aimed to provide a portrait of the extent of within-school stratification by site of Hispanic settlement, its effect on the post-secondary enrollment of Hispanic students and the extent to which this effect may vary by place. In doing so, I extend prior work on 21st century Hispanic sites of settlement and their effects on student achievement (See Chunduru, 2020a; Chunduru, 2020b). Established sites demonstrate significantly higher levels of within-school stratification, a result which suggests support for two of the three theorized mechanisms: racial and ethnic diversity and the social and legal contexts of areas. In contrast to prior literature, I found that the pace of demographic change is negatively associated with stratification. Newer sites had much lower levels of stratification compared to established sites. In fact, the more stable an area was, e.g. established, the more likely it was to have stratified schools.

I find that within-school stratification is significantly and negatively associated with college-entry even after accounting for individual and school factors. College-going in established sites is higher than expected given the extent of within-school stratification. Overall post-secondary success as determined by other measures such as persistence in college is also highest in established sites (See Table 1). This outsized level of college-going and post-secondary success in established sites may be the result of institutional and co-ethnic supports not available in newer sites. These supports may be protecting students against the potential negative effects of higher levels of stratification in these areas.

Once co-ethnic education is included, the effect of within-school stratification on college-going loses significance. The effects of place-based stratification, as measured by co-ethnic education, may overpower the effects of within-school stratification. Furthermore, there is no evidence to suggest that this effect varies by place in a meaningful way. Although the extent of stratification may vary by site, the area in which students grow up matters more. In particular, the co-ethnic status of Hispanics in an area matters, perhaps more than the school, itself. The institutional supports and power ascribed to Hispanics by area likely shapes a student's opportunities more than the school, itself. However, it is also likely that the selection processes that influence Hispanics migration to certain areas for labor opportunities are a function of co-ethnic education levels. Therefore, areas with more educated Hispanics are more likely to attract more educated Hispanics contributing to greater levels of homogeneity. A deeper exploration into the mechanisms associated with each of these sites is warranted. Furthermore, focusing on other school-level mechanisms that may be influential in shaping post-secondary educational attainment is critical for understanding the interaction between place, schooling, and student outcomes.

Appendix

TABLE A1. Weighted Descriptive Statistics of Imputed Sample and Full Sample

	Hispanic Students		**Imputed Sample**		**Full Sample**	
	Size (n)	**Mean**	**Size (n)**	**Mean**	**Size (n)°**	**Mean**
Outcomes						
College-going	2,137	66.22%	13,351	68.43%	16,467	70.15%
Level of College*	2,127		13,309		16,340	
4-year		27.95%		39.44%		42.25%
2-year		34.09%		25.89%		24.94%
N/A or Other		37.96%		34.67%		32.61%
Persisted in College	2,137		13,351		16,391	
N/A		33.78%		29.21%		29.85%
Left college		25.88%		23.98%		23.86%
In college		40.35%		44.45%		46.29%
Graduated High School	2,133		13,334	90.70%	16,640	91.26%
Independent Variables						
Race & Ethnicity	2,137		13,351		16,478	
American-Indian		n/a		0.60%		0.66%
Asian		n/a		3.59%		3.57%
Black		n/a		14.17%		13.60%
Hispanic	2,137	100%		22.91%		22.04%
Multi-ethnic		n/a		7.99%		7.89%
NHPI^		n/a		0.48%		0.46%
White, NH^		n/a		50.26%		51.79%
GPA	2,135	2.38	13,340+	2.62	16,439	2.65
Parent attended college	2,137	30.65%	13,351	49.59%	15,553	53.45%
Family SEI	2,137	49.24	13,351	55.19	15,284	56.36
Parent has difficulty speaking English	2,137	22.43%	13,351	6.22%	15,697	6.22%
School-level variables						
School-level mean SEI	2,137	49.24%	13,351	24.42	13,417	24.41
Pct. Hispanic	2,137	45.81%	13,351	20.75%	16,262	19.92%
Per-pupil total exp.	2,137	$16,729	13,351	$14,897	13,270	$14,953
District Variables						
Pct. of Hisp. pop. with a bach. degree	2,137	13.00%	13,351	15.47%	13,068	15.12%

Note. Data are weighted by combined analytic and response HSLS weight, *w3w1stutr.*
*Percentages of students in the sample that are in each category do not add up to 100, because remaining percent either did not attend college or did not respond to this question.
+Sample sizes for these variables vary from the analytic sample because these variables are not included in the final model. Therefore, they were not incorporated into the single imputation technique used to account for missingness. They are only included for reference in descriptive statistics.
°Size of sample varies per variable, because of non-response across the sample. Weighting the sample, further limits certain sample sizes. The unweighted sample with intended participants was 25,206 students.
^NHPI is an abbreviation for Native Hawaiian Pacific Islander and White, NH is an abbreviation for White, Non-Hispanic

TABLE A2. Demographic Characteristics of School Districts in Each Site

	Established Sites	20th Century Sites	21st Century Sites	Non-Site, Some Hispanic	Non-Site, Few Hispanic
Pct. Hispanic	48.13 (0.45)	24.34 (0.28)	18.45 (0.33)	6.45 (0.06)	1.40 (0.02)
Pct. Non-Hispanic White	33.76 (0.50)	56.04 (0.42)	57.8 (0.83)	75.63 (0.20)	84.84 (0.45)
Pct. Non-Hispanic Black	6.07 (0.14)	13.48 (0.25)	15.54 (0.53)	11.66 (0.16)	10.74 (0.45)
Pct. Non-Hispanic American-Indian	0.38 (0.02)	0.39 (0.01)	0.95 (0.07)	0.98 (0.08)	0.62 (0.06)
Pct. Non-Hispanic Asian	9.50 (0.31)	3.63 (0.07)	3.98 (0.14)	2.95 (0.05)	0.76 (0.03)
Pct. Non-Hispanic Hawaiian Pacific Islander	0.23 (0.01)	0.07 (0.00)	0.13 (0.01)	0.09 (0.00)	0.03 (0.00)
Pct. Foreign-Born	26.21 (0.35)	16.13 (0.16)	12.16 (0.28)	6.77 (0.07)	1.71 (0.03)
Pct. Foreign-Born after 2000	29.41 (0.21)	36.76 (0.21)	42.98 (0.63)	39.66 (0.17)	31.82 (0.51)
Pct. Foreign-Born after 2010	7.11 (0.10)	9.06 (0.11)	11.62 (0.28)	11.69 (0.10)	10.52 (0.33)
Pct. of Hispanic Pop. With Bachelor’s or More	11.88 (0.17)	12.55 (0.16)	11.80 (0.30)	17.44 (0.15)	16.27 (0.42)
Pct. Poor	17.14 (0.16)	17.08 (0.16)	18.48 (0.30)	14.08 (0.09)	17.15 (0.17)
Pct. Poor Under 18	23.63 (0.25)	24.23 (0.24)	26.53 (0.46)	19.55 (0.14)	24.05 (0.28)

Note. Data sourced from the American Community Survey 5-year estimates for school-district boundaries. Values denoted in percent and corresponding standard error.

TABLE A3. Cell Sizes by Outcome and Site

		High School Grad		College-Going		College-Level			Persisted		
	Cell Size	No	Yes	No	Yes	Not in College or Other	Four-Year	Two-Year	Never Went to College	Dropped Out	In College
Established Sites	990	128	853	301	689	348	241	396	301	235	453
20th Century Sites	551	81	469	217	333	241	154	154	217	125	209
21st Century Sites	160	12	149	35	126	38	64	58	35	74	51
Non-Site*, Some Hisp.	401	25	375	149	252	162	127	112	149	114	138
Non-Site*, Few Hisp.	35	6	28	19	15	20	9	6	19	5	11

N = 2,137 Hispanic students. Data are weighted by HSLS-provided analytic weight, *w3w1stutr*.

TABLE A4. Within-School Stratification Distribution by Site for Hispanic Students

	Established Sites	20th Century Sites	21st Century Sites	Non-Site, Some Hispanic*	Non-Site, Few Hispanic*
Hispanic					
Percent of School	53.13	31.73	21.21	7.76	1.02
	(0.64)	(0.46)	(0.42)	(0.09)	(0.02)
Within-School Stratification	0.80	0.05	0.06	-1.20	-2.55
	(0.05)	(0.05)	(0.08)	(0.03)	(0.05)
Black					
Percent of School	7.11	18.16	21.14	17.86	16.26
	(0.68)	(0.47)	(0.74)	(0.27)	(0.68)
Within-School Stratification	-1.19	-1.14	-0.70	-1.79	-2.75
	(0.05)	(0.06)	(0.11)	(0.03)	(0.06)
Hispanic & Black					
Percent of School	60.24	49.89	42.35	17.28	25.62
	(0.65)	(0.56)	(1.03)	(0.68)	(0.29)
Within-School Stratification	1.49	0.50	0.19	0.48	0.14
	(0.07)	(0.05)	(0.11)	(0.03)	(0.05)

N = 13,351.

Note. Means or percentages shown, with standard deviations in parentheses. Data are weighted by HSLS provided weight, *w3w1stutr.* Data are also single imputed. I use the analytic sample rather than just the limited sample of Hispanic students to compare Hispanic and Black stratification.

* These areas are referred to as non-sites, e.g. sites that do not meet the thresholds of growth and absolute population to qualify as sites of Hispanic settlement, but either contain a notable number of Hispanics or very few Hispanics as demarcated by “Some Hispanic” and “Few Hispanic.” Non-site comparisons are more difficult to interpret, given the negative values of the within-school stratification measure, which result from the low concentrations of Hispanic students in each school, on average

Sensitivity Analysis 1: Regression outcomes if all high schools with fewer than 3 Hispanic students were dropped

TABLE A5. Effect of Within-School Stratification on College-Going (Sensitivity Analysis 1)

	Model 1	**Model 2**	**Model 3**
Within-school stratification (WSS)	-0.158*	-0.158*	-0.115
	(0.080)	(0.080)	(0.082)
Site (Ref: Established Site)			
20th Century Sites	-0.702*	-0.655*	-0.713*
	(0.311)	(0.313)	(0.329)
21st Century Sites	-0.030	0.208	-0.030
	(0.744)	(0.776)	(0.872)
Non-Site, Some Hispanic	-0.221	-0.220	-0.650
	(0.254)	(0.259)	(0.394)
Interactions between WSS & Site (Ref: Established Site)			
20th CS x WSS	0.082	0.040	0.005
	(0.121)	(0.125)	(0.128)
21st CS x WSS	0.069	0.039	0.072
	(0.257)	(0.264)	(0.277)
Non-Site, Some Hispanic	-0.068	-0.057	-0.082
	(0.103)	(0.109)	(0.109)
Student-Level Variables			
Parent attended college		0.993***	0.847***
		(0.230)	(0.241)
Family SEI		0.010	0.009
		(0.006)	(0.006)
Parent has difficulty speaking English		0.115	0.214
		(0.211)	(0.217)
School-Level Variables			
Within-school stratification, 9th grade			-0.047
			(0.034)
School's Hispanic Percentage			-0.007
			(0.006)
Per-pupil cost-adjusted total expenditures			-0.000*
			(0.000)
School-level mean SEI			0.004
			(0.007)
District-Level Variables			
Pct. of Hispanic / Latino pop. with a Bach. Degree			0.032*
			(0.014)
Constant	1.066***	0.226	0.350
	(0.166)	(0.300)	(0.584)

N = 1,081 *** p<0.001, ** p<0.01, * p<0.05
Note. Coefficients are shown, with robust standard errors in parentheses, unless otherwise noted.

TABLE A6. Marginal Effect Percentages of WSS on College-Going by Site (Sensitivity Analysis 1)

	Model 1	Model 2	Model 3
Established Sites	-3.26*	-3.08	-2.19
	(1.62)	(1.63)	(1.57)
20th Century Sites	-1.85	-2.63	-2.45
	(2.19)	(2.03)	(2.13)
21st Century Sites	-1.81	-2.10	-0.80
	(4.65)	(4.13)	(4.78)
Non-Site, Some Hispanic	-5.04***	-4.52**	-4.28
	(1.32)	(1.39)	(1.42)
Site & stratification interaction	X	X	X
Student-level covariates		X	X
School-level covariates			X
Site-level covariates			X

N = 1,081 *** $p<0.001$, ** $p<0.01$, * $p<0.05$

Note. Marginal effect percentages are shown with standard errors in parentheses. The estimates represent the change in the percent of college-going from one unit increase in WSS by site.

Sensitivity Analysis 2: Regression outcomes if WSS at 5th and 95th percentile were dropped

TABLE A7. Effect of Within-School Stratification on College-Going (Sensitivity Analysis 2)

	Model 1	**Model 2**	**Model 3**
Within-school stratification (WSS)	-0.206**	-0.213**	-0.187*
	(0.077)	(0.079)	(0.083)
Site (Ref: Established Site)			
20th Century Sites	-0.721*	-0.678*	-0.664*
	(0.285)	(0.282)	(0.289)
21st Century Sites	0.153	0.274	0.351
	(0.596)	(0.642)	(0.706)
Non-Site, Some Hispanic	-0.767***	-0.827***	-0.933**
	(0.198)	(0.197)	(0.295)
Interactions between WSS & Site (Ref: Established Site)			
20th CS x WSS	0.168	0.136	0.094
	(0.126)	(0.132)	(0.145)
21st CS x WSS	0.237	0.179	0.199
	(0.237)	(0.239)	(0.235)
Non-Site, Some Hispanic	0.242*	0.229*	0.218*
	(0.110)	(0.105)	(0.107)
Student-Level Variables			
Parent attended college		1.030***	0.955***
		(0.175)	(0.182)
Family SEI		0.006	0.006
		(0.006)	(0.006)
Parent has difficulty speaking English		0.171	0.197
		(0.154)	(0.153)
School-Level Variables			
Within-school stratification, 9th grade			-0.065*
			(0.031)
School's Hispanic Percentage			0.001
			(0.005)
Per-pupil cost-adjusted total expenditures			-0.000*
			(0.000)
School-level mean SEI			0.004
			(0.006)
District-Level Variables			
Pct. of Hispanic / Latino pop. with a Bach. Degree			0.027*
			(0.011)
Constant	1.146***	0.535	0.217
	(0.149)	(0.295)	(0.499)

N = 1,813 *** p<0.001, ** p<0.01, * p<0.05

Note. Coefficients are shown, with robust standard errors in parentheses, unless otherwise noted.

TABLE A8. Marginal Effect Percentages of WSS on College-Going by Site (Sensitivity Analysis 2)

	Model 1	Model 2	Model 3
Established Sites	-4.09**	-4.07**	-3.52*
	(1.47)	(1.47)	(1.54)
20th Century Sites	-0.93	-1.75	-2.07
	(2.36)	(2.36)	(2.67)
21st Century Sites	0.51	-0.53	0.17
	(3.78)	(3.45)	(3.28)
Non-Site, Some Hispanic	0.84	0.36	0.71
	(1.85)	(1.55)	(1.61)
Site & stratification interaction	X	X	X
Student-level covariates		X	X
School-level covariates			X
Site-level covariates			X

N = 1,081 *** $p<0.001$, ** $p<0.01$, * $p<0.05$

Note. Marginal effect percentages are shown with standard errors in parentheses. The estimates represent the change in the percent of college-going from one unit increase in WSS by site.

Sensitivity Analysis 3: Regression outcomes if WSS less than zero were dropped

TABLE A9. Effect of Within-School Stratification on College-Going (Sensitivity Analysis 3)

	Model 1	**Model 2**	**Model 3**
Within-school stratification (WSS)	-0.254*	-0.269**	-0.217*
	(0.101)	(0.101)	(0.105)
Site (Ref: Established Site)			
20th Century Sites	-1.026**	-1.055**	-1.113**
	(0.397)	(0.374)	(0.353)
21st Century Sites	-0.673	-0.682	-0.932
	(0.379)	(0.387)	(0.483)
Non-Site, Some Hispanic	-0.574	-0.781*	-1.059*
	(0.393)	(0.394)	(0.502)
20th CS x WSS	0.290	0.280*	0.248
	(0.152)	(0.142)	(0.144)
21st CS x WSS	0.365*	0.331*	0.395*
	(0.157)	(0.154)	(0.163)
Non-Site, Some Hispanic	0.113	0.159	0.133
	(0.148)	(0.144)	(0.154)
Student-Level Variables			
Parent attended college		1.016***	0.900***
		(0.191)	(0.202)
Family SEI		0.002	0.002
		(0.006)	(0.006)
Parent has difficulty speaking English		-0.050	0.024
		(0.170)	(0.172)
School-Level Variables			
Within-school stratification, 9th grade			-0.089**
			(0.033)
School's Hispanic Percentage			-0.003
			(0.006)
Per-pupil cost-adjusted total expenditures			-0.000**
			(0.000)
School-level mean SEI			0.001
			(0.006)
District-Level Variables			
Pct. of Hispanic / Latino pop. with a Bach. Degree			0.030*
			(0.013)
Constant	1.304***	0.975**	0.917
	(0.244)	(0.374)	(0.590)

N = 1,249 *** p<0.001, ** p<0.01, * p<0.05
Note. Coefficients are shown, with robust standard errors in parentheses, unless otherwise noted.

TABLE A10. Marginal Effect Percentages of WSS on College-Going by Site (Sensitivity Analysis 3)

	Model 1	Model 2	Model 3
Established Sites	-5.28**	-5.30**	-4.11*
	(2.00)	(1.92)	(1.95)
20th Century Sites	0.87	0.26	0.70
	(2.75)	(2.29)	(2.24)
21st Century Sites	2.31	1.28	3.61
	(2.50)	(2.38)	(2.56)
Non-Site, Some Hispanic	-3.33	-2.50	-1.92
	(2.45)	(2.29)	(2.62)
Site & stratification interaction	X	X	X
Student-level covariates		X	X
School-level covariates			X
Site-level covariates			X

N = 1,249 *** p<0.001, ** p<0.01, * p<0.05
Note. Marginal effect percentages are shown with standard errors in parentheses. The estimates represent the change in the percent of college-going from one unit increase in WSS by site.

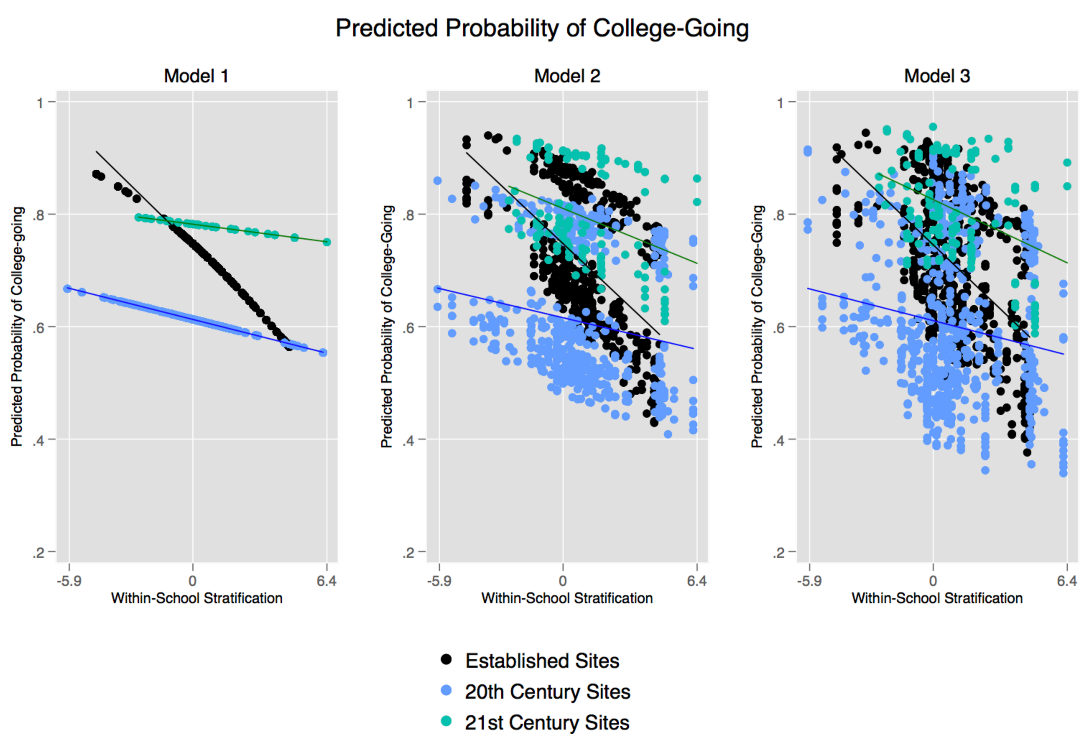


FIGURE A1. Predicted probability values of college-going by site, over range of within-school stratification. Results extracted from models in Table 4.

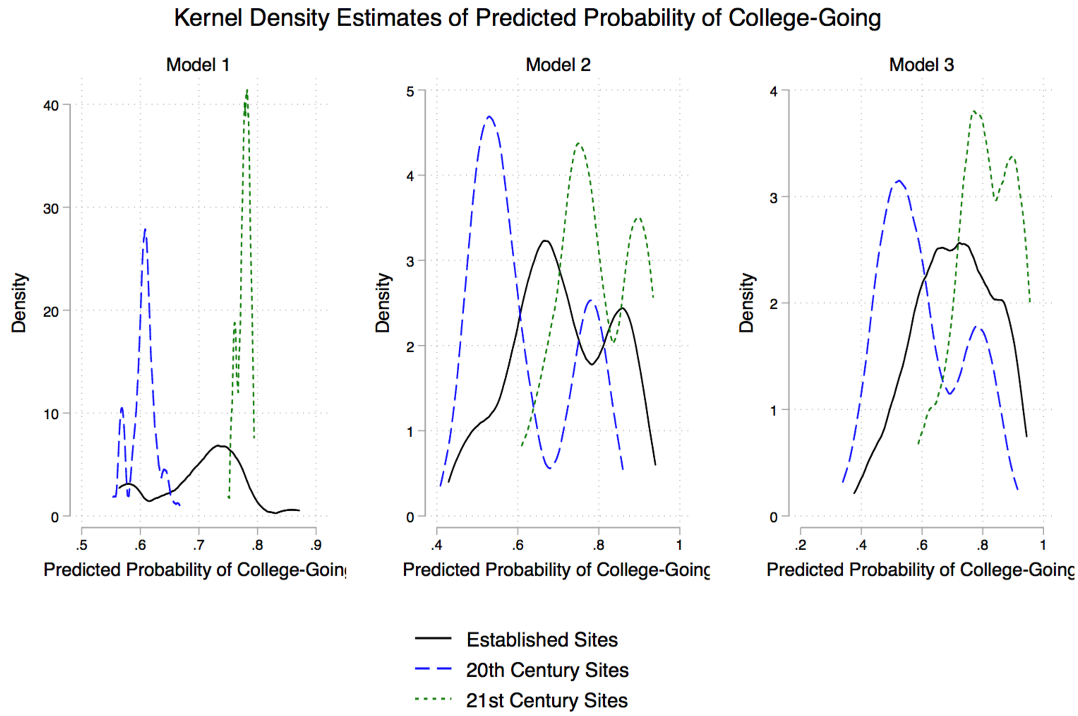


FIGURE A2. Kernel Density Estimates of the predicted probability of college-going. Results extracted from models in Table 4.

Chapter 5

Afterword

Afterword

Using large-scale datasets, this project paints a national portrait of the relationship between place, institutions, and\student outcomes, specifically for Hispanic students. In Paper 1, I aimed to develop a categorization for Hispanic sites of settlement that distinguished between the causes of Hispanic migration and dispersion that occurred between 1990 and 2000 and 2000 onwards. The findings indicated that the Hispanic movement that led to the development of 21st century sites is likely a different phenomenon than the one that contributed to the movement that formed 20th century sites. The composition of the Hispanic population in 21st century sites suggests that Hispanics that migrated to 21st century sites were more likely to be native-born Hispanics and more educated than those that migrated to 20th century sites. The co-occurring effects of rising costs in large urban cities as well as the rise of technology industries throughout the South were likely contributors to this movement. In contrast, 20th century sites, while still maintaining higher rates of economic and educational well-being than Hispanics in established sites, are not as advantaged as 21st century sites. Furthermore, in comparison to 20th century sites, schools in 21st century sites are also comprised of lower concentrations of Hispanic students, spend more on students and are slightly more integrated than schools in 20th century sites. These indicators suggest that schools in these areas are better prepared to respond to demographic change than their counterpart schools in 20th century sites. Later findings, however, suggest that this is not the case.

In the second paper, I explored how settlement sites shape student achievement. The findings revealed that the heightened cause of concern for the achievement of

Hispanic students in these new areas might be misplaced. However, greater nuance for understanding the patterns of achievement may be needed, which the use of middle- and high-school achievement data revealed. While 8^{th} grade students in 20^{th} and 21^{st} century sites outperform their peers in established sites, 12^{th} grade students in 21^{st} century sites underperform. However, there is a strong positive effect of 20^{th} century sites for Hispanic 12^{th} graders. Based on the findings from the first two papers, the relative socioeconomic and school-level advantages of 21^{st} century sites compared to 20^{th} century sites, the findings that students in 20^{th} century sites in both middle and high school significantly outperform their peers are unexpected. Even after accounting for several individual-, school-, and site- level mechanisms, a positive 20^{th} century site effect persisted for both 8^{th} and 12^{th} grade students. Other case studies suggest that despite being less advantaged in the traditional sense, schools in 20^{th} century sites might be more likely to implement reforms and initiatives to meet the needs of Hispanic newcomers. Given that 21^{st} century sites are relatively new to determining how to meet the needs of Hispanic students, they might not yet have adopted such reforms. Furthermore, analysis of the interaction between site and race-ethnicity suggests that there is a specific and additional place-based effect that occurs between 20^{th} and 21^{st} century sites, even after accounting for individual-, school-, and site-level characteristics.

The third and final paper explored one secondary school-level mechanism – within-school stratification – and its relationship to place and students' long-term outcomes. I theorized that within-school stratification is and continues to be a racialized process by which schools stratify students into broader social structures. Furthermore, I argued that the extent to which within-school stratification varies by place is a reflection of place stratification theory, specifically the relative co-ethnic status of Hispanics in each site. Unfortunately, the results of the analysis do not find evidence to support such an argument. While the presence of within-school stratification varies significantly by site, such that newer sites are much less likely to be stratified, the results illustrate that the effect of within-school stratification does not vary meaningfully by site. Furthermore, within-school stratification does not meaningfully change the predicted values for the four outcomes tested, nor does it affect the differences in the outcomes by site. Nonetheless, several other findings are worthy of consideration.

Overall, students in established sites appear to be most likely to achieve post-secondary success given their likelihood of attending college and persisting in them. Between 20th and 21st century sites, students in the latter appear to be more likely to pursue post-secondary education, but these are largely two-year programs. Furthermore, they are the least likely to persist in them. These findings suggest that although stratification may vary by site, place-based effects are much more critical in determining post-secondary success. The institutional and co-ethnic supports provided by established sites that do not exist in newer sites are likely promoting post-secondary success among Hispanic students at significantly higher rates. Distinguishing between the place-based effects of 20th and 21st century sites is more difficult given the mixed findings of this study.

Afterword

The narrative painted by this project suggests diverging stories for achievement and post-secondary educational attainment. While student achievement in newer sites is, for the large part, higher than in established sites per the results of Paper 2, the post-secondary attainment and success of students is far lower. The contributors to post-secondary attainment, particularly for Hispanic students, many of whom might be immigrants, is a far more complex process that may extend beyond the functions of secondary schooling. For example, even if access to K-12 education were properly protected for students, work and college admission restrictions for unauthorized populations limit access to higher education and career opportunities (Lopez, 2005). The focus of policy and research related to the educational attainment of Hispanic students is a largely futile effort if policies related to access to public and private universities in new destinations are not considered. While these issues are not explored in this project, the divergent findings between achievement and educational attainment between sites indicate a greater need for the exploration into how new sites may better support Hispanic students' pursuit of post-secondary education. Furthermore, the higher levels of achievement in newer sites for Hispanic students suggest that established sites may have much to glean from newer sites for increasing the achievement of Hispanic students.

Some limitations to consider for this entire project include, but are not limited to, the use of cross-sectional data to determine the effects of place on achievement, the sample size of Hispanics in HSLS to determine the effects of within-school stratification on long-term outcomes, as well as the conception of Hispanics as a category without distinguishing between the various countries of origin of students. This project contributes to the existing “new destination” literature by distinguishing between sites that were settled in the late 20th and early 21st centuries. Furthermore, it explores both achievement and post-secondary educational attainment as outcomes that are intrinsically tied to place. While I find positive indications of achievement in new sites, post-secondary educational attainment is far less positive in these areas. I also consider how school-level mechanisms interact with place to shape student outcomes. Although the results for this latter component are not necessarily compelling, greater exploration into this interaction may be warranted.

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DHATHRI CHUNDURU

821 Porter Rd. Apt. 201 Nashville, TN 37206
(404) 574-8848 l dchundu1@jhu.edu l linkedin.com/in/dhathrichunduru

EDUCATION

Doctorate of Philosophy - Sociology of Education (May 2020)
Johns Hopkins University, Baltimore, MD

- Dissertation: 20th and 21st Century Sites of Hispanic Settlement: Three Essays on Place, Schooling, and Student Outcomes
- Dissertation Committee:
  Chair: Professor Stephen L. Morgan, Ph.D.
  Professor Julia Burdick-Will, Ph.D.
  Professor Norma Day-Vines, Ph.D.

Master of Public Policy - Public Policy Analysis (May 2016)
University of Chicago, Chicago, IL

Bachelor of Science - Political Science Major and Economics Minor (May 2008)
Vanderbilt University, Nashville, TN

PUBLICATIONS

MANUSCRIPTS IN PROGRESS

Chunduru, Dhathri. Knowledge is Access: How Knowledge of Financial Aid Eligibility Affects College Enrollment. *Under review..*

Chunduru, Dhathri. 20th and 21st Century Hispanic Settlement Sites: A Novel Categorization that Distinguishes between Era-Specific Migration Patterns. *Under review.*

Chunduru, Dhathri. 20th and 21st Century Hispanic Settlement Sites: Place and Student Achievement. *In progress.*

Chunduru, Dhathri. 20th and 21st Century Hispanic Settlement Sites: Within-School Stratification, Post-Secondary Outcomes, and Place. *In progress.*

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Chunduru, Dhathri. (2016). Behind the Numbers: Shining a light on Illinois' street-lighting district. *Metropolitan Planning Council* Retrieved from here.

Chunduru, Dhathri (2014). Special Education: Are Standards for our Teachers Acceptable? *The Idaho Press. Retrieved from* here*.*

Chunduru, Dhathri (2013). College Offers Route to Power, Future. (2013). *Atlanta Journal Constitution*. *Retrieved* from here.

CONFERENCE PRESENTATIONS

Poster, March 2019: "A Proposal for Causal Analysis of School-Level Resources: The Effect of Counselor Caseload Size on College Enrollment." Presented at Society for Research on Educational Effectiveness, Washington, D.C.

Paper, April 2019: "College-Going Hispanic Students' Math and Science Expectancy-Value Latent Classes and Majoring in STEM." Presented at American Educational Research Association, Toronto, Ontario

GRANTS

21st Century Cities Award for Doctoral Research on Urban Issues, May 2019, Johns Hopkins University, *$5,000*

Johns Hopkins School of Education Conference Travel Grant, September 2018, *$800*

Polsky Center for Entrepreneurship I-Corps Fellowship, March 2015, *$2,500*

AWARDS & HONORS

New Leaders Council Fellow, January 2016

Harris School of Public Policy Merit Scholarship, The University of Chicago, August 2014

Sue Lehmann Award for Excellence in Teaching National Finalist, Teach For America, May 2010

Golden Apple Award for Excellence in Teaching, January 2010

UNIVERSITY TEACHING EXPERIENCE

Instructor (Seminar in Transformational Teaching, Parts I – IV), Masters in Education Program, 1/17 – present l Johns Hopkins University School of Education.

Teaching Assistant (Hierarchical Linear Models), PhD Program, 9/19 – 12/19 l Johns Hopkins University School of Education.

REVIEWS

AERA Open Sage Journals

OTHER EXPERIENCE

Research Assistant, 05/17 – Present
Prof. Stephen L. Morgan, Johns Hopkins University, Baltimore, MD

Research Fellow, 05/15 – 11/15
Metropolitan Planning Council, Chicago, IL

Research Fellow, 08/14 – 05/15
Behavioral Insights and Parenting Lab, Chicago, IL

Managing Director, Teacher Leadership Development 6/12 – 6/14
Teach For America, Atlanta, GA

School Director, 1/14 – 5/14
Harper-Archer Middle School Summer Institute Atlanta, GA

Manager, Teacher Leadership Development 6/10 – 5/12
Teach For America, Atlanta, GA

Teacher, 8/08 – 5/10
Renaissance Middle School, Fairburn, GA

UNIVERSITY SERVICE

Organizing member, 15th International Workshop on Higher Education Reform, 01/18 – 09/18
Johns Hopkins University Institute for Education Policy

Co-chair, Community Action Bureau, 12/1 – 06/16
The University of Chicago, Chicago, IL

Founder, Diversity and Inclusion Advisory Board, 01/16
Harris School of Public Policy, Chicago, IL

Founder, Racial Justice Campus-Wide Dialogue, 11/14
The University of Chicago, Chicago, IL